INSIDE: MONTANA-STYLE THAI CATFISH CAKES

Montana Outdoors

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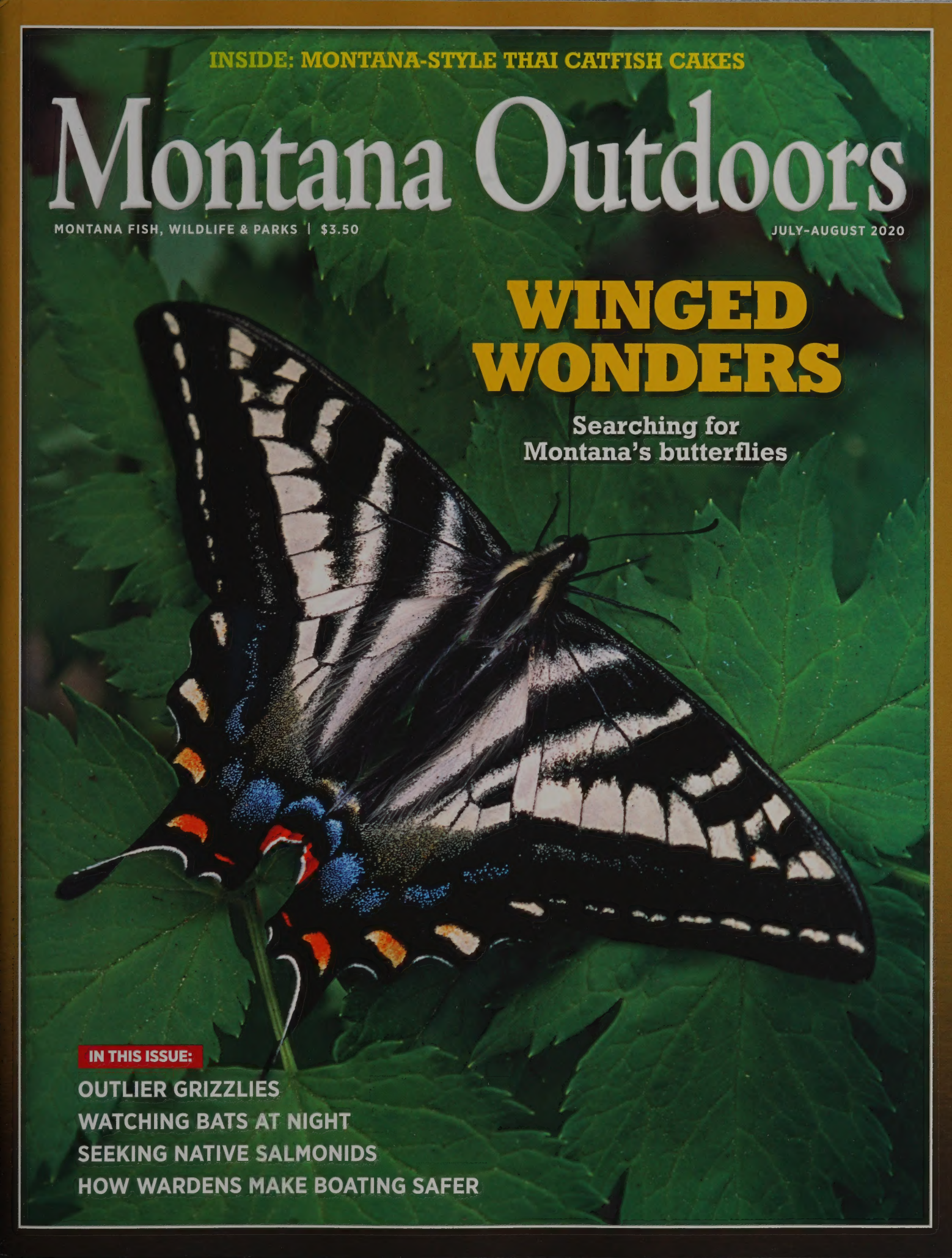
JULY–AUGUST 2020



WINGED WONDERS

Searching for Montana's butterflies

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OUTLIER GRIZZLIES

WATCHING BATS AT NIGHT

SEEKING NATIVE SALMONIDS

HOW WARDENS MAKE BOATING SAFER

Montana Outdoors

FIRST PLACE MAGAZINE:
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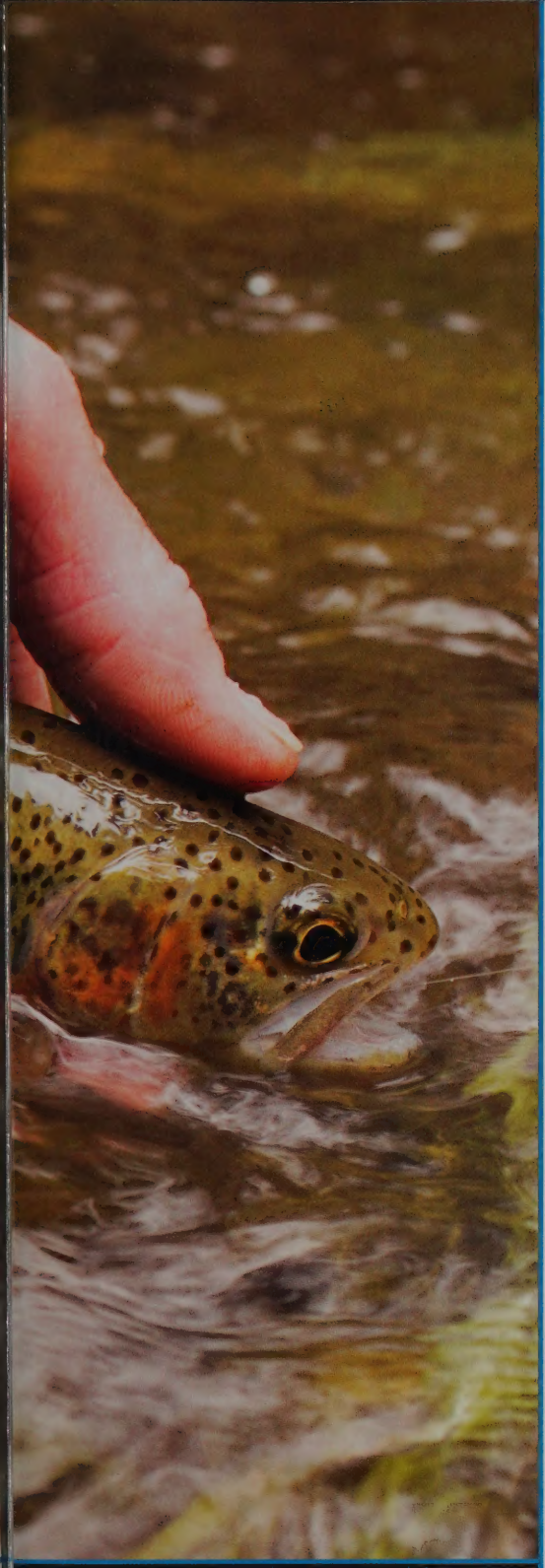

MINIATURE STEELHEAD A redband trout is released in a tiny tributary of the Yaak River. The species is a remnant of the mighty steelhead that once migrated to northwestern Montana from the Pacific Ocean. Follow one angler's search for all nine of Montana's native salmonids on page 12. Photo by Jeremie Hollman.

FRONT COVER The pale swallowtail is just one of roughly 200 butterfly species in Montana. See page 16 to learn why and how scientists look for these winged wonders. Photo by Paul Lally.

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Struck a chord

Having taken part in many catch-and-release discussions over the years, I read your thoughtful article on the subject with interest ("Has Catch-and-Release Gone Overboard?" May-June 2020). The article correctly identifies the distinction between biological problems and social conflicts. The core issue is our society's increasing tendency to frame differences of opinion in absolute, all-or-none terms. The correct approach is usually: It depends. In the case of native fish facing environmental pressures (as with Montana cutthroats, grayling, and bull trout), the fish should go back in the water. Bass, northern pike, and other nonnative invasives with robust populations can be eaten with a clear conscience. Circumstances matter, too. Releasing trout in accessible, heavily fished waters makes sense. However, as I frequently had to point out when I was guiding in Alaska, eating a salmon that would be dead in a few weeks anyway comes at a lower environmental cost than raising a hog in Iowa, processing it, and flying a ham to Anchorage.

Don Thomas
Lewistown

I hardly return from a fishing outing without a couple of fish in my little blue fish bucket. Until I read your article on catch-and-release, I wasn't aware that so few people harvest their fish. And I had little idea that harvest shaming was a thing. Shame on anyone who does that.

In addition to gaining relaxation and therapy, I fish to obtain fresh, wild-caught, organic food. Whether it's trout from nearby Bear Paw Lake or Beaver Creek Reservoir, or walleyes from Fresno Reservoir, I eat my catch.

I'm grateful for FWP's science-based work. Harvest shaming is yet another sign that we've overcorrected, that in our successful conservation attempt we've gone too far and are, yet again, missing the mark when it comes to our connection to the land.

I hope that more anglers will once again take part in what our ancestors have done for thousands of years—harvesting some of their fish for food. And maybe that will lead to more big fish for me to catch and eat.

Paul Dragu
Havre

As someone who keeps an occasional fish, and fishes with Rapalas as well as flies, I've weathered my share of dirty looks on the Yellowstone, Gallatin, and Madison Rivers. Hopefully, some of these soreheads will lighten up after reading your article on catch-and-release. After all, as I've said to other anglers, "The state of Montana sets the rules, not you."

Breck Fleeson
Minneapolis

Has Catch-and-Release Gone Overboard?
The case for harvesting trout
By Tom Dickson

BAIT FISHERMEN SUCK

"I know they mean well, but fly anglers who scorn spin and bait anglers are just driving people away from fishing altogether."

Coincidental to publication of your insightful article on some of the unintended drawbacks of catch-and-release fishing on trout waters, I learned that the same lessons apply to farm ponds stocked with largemouth bass. Many of us here in the Southeast have noticed that the catch of 12-inch-plus bass rapidly declines in ponds over the years. The primary reason, according to Jim Rice, retired professor of applied ecology at North Carolina State University, is that we don't remove enough of the bass, which then overpopulate the pond. All this time, I have been practicing catch-and-release so I would have more and bigger fish to catch. Turns out, I was shooting myself in the foot.

John Manuel
Durham, NC

Happy subscriber

I want to thank FWP director Martha Williams for her director's message in the May-June issue that pays tribute to Block Management cooperators and other landowners ("Appreciating Land-owners"). It is a pleasure to open my land to hunters. They are better educated and more polite than they used to be 50 years ago, thanks to FWP's efforts. I also appreciate Ms. Williams's kind words about landowners' contributions to wildlife habitat.

That same issue also included a portrait of the avocet, one of my favorite birds (I live right next to Freezeout Lake). I've been watching birds every since I was a child living near Malheur National Wildlife Refuge in Oregon.

Finally, I found your ending editorial very "reassuring."

You described so poetically the meaning of spring to me. I especially liked the line, "I find reassurance in nature's relentless reliability."

A.J. Harris
Fairfield

Less mowing, more birds

I read with interest the short article in your November-December 2019 issue titled "'Really wrong' bird losses," about the disappearance of nearly 3 billion birds in the United States and Canada since 1970. One reason for the decline could be the increase in mowing grass and brush, what we Southerners call "brush hogging." Maybe the answer to stopping bird losses is simply to end all this mowing, or at least stop it during the summer growing season when birds and pollinators need those grasses and forbs.

David Yoder
Auburn, KY

EDITOR'S NOTE: COVID-19 restrictions involving social distancing may affect activities in Montana this summer. Please check **fwp.mt.gov** or **mt.gov** for information about hours, capacity, and other details before making plans. Also note that the Centers for Disease Control now recommends greater social distancing (and the use of face masks) than shown in several photos in this issue that were taken before the pandemic began.

CORRECTION

In "Blaming the Birds" (May-June 2020), we incorrectly credited the photograph of the osprey on page 43 of the article. The photo was taken by Kate Davis.

Spicy Thai Fried Catfish Cakes (Tod Mun Pla)

By David Schmetterling | Preparation time: 15 minutes | Cooking time: 5–10 minutes | Serves 4

Thai food is simple and easy to prepare, and the ingredients are bold and fresh. Although Montana's culture, climate, and landscapes differ entirely from Thailand's, I enjoy preparing Thai dishes—with a Montana twist.

For this recipe, catfish link the two cultures. The Mekong River that forms Thailand's northeastern border is home to 22 species of catfish, including the Mekong giant catfish, which can top 650 pounds and is the world's largest freshwater fish species. From my several visits to Southeast Asia, I've learned that catfish are part of the cuisine in many villages along the Mekong's route from China to Vietnam.

Montana has four catfish species, notably the channel catfish, found in the middle to lower reaches of the Missouri and Yellowstone Rivers and their tributaries.

Each spring, friends and I fish for channel cats on the Missouri between Fort Benton and Fort Peck Reservoir using set lines baited with chunks of sucker or goldeye. We fish when water temperatures are rising and consistently over 50 degrees F. Typically we keep catfish that are between two and five pounds, although we do catch much larger ones.

Filleting and preparing catfish is not difficult. The trick is to remove any colored muscle or fat and then get the fillets on ice as soon as possible. This ensures the meat will be sweet, flaky, and firm instead of muddy tasting and mushy.

Fish cakes are a common way of preparing catfish and other species found in the Mekong. My favorite is Tod Mun Pla. You can find most of the ingredients, including red curry paste, in many chain grocery stores across Montana. Harder to locate are Thai lime leaves and Thai chili peppers, found mainly in the Asian food markets in big cities. For lime leaves, substitute 1 teaspoon each of lemon and lime zest. For Thai chili peppers, substitute any hot pepper you can tolerate. If you like really spicy dishes, increase the amount of red curry paste.

Serve with cooked white rice and the cucumber relish on the side.

—David Schmetterling is FWP's Fisheries Research Program manager in Missoula.

INGREDIENTS

- 1 lb. channel catfish fillets (or walleye, yellow perch, haddock, cod, or tilapia)
- 1 egg
- ¾ c. finely sliced green beans
- 6 Thai lime leaves, finely sliced (or 1 t. each lemon and lime zest)
- 1 t. brown sugar
- 1 t. salt
- 1½ T. red curry paste
- 4 T. vegetable oil for frying

DIRECTIONS

Cut fillets into pieces small enough to fit into a food processor or blender and grind them into a paste. You can also mash the fish with a fork in a bowl.

In a large mixing bowl, beat the egg. Add the green beans, lime leaves or zest, brown sugar, salt, and curry paste. Mix with your hands until the ingredients are blended. Wet your hands and form four or five patties. Be careful not to touch your eyes during this step. The curry paste will burn them.

Heat the oil in a large frying pan on high until a test drop of water pops and crackles. Add the fish cakes. Fry for two minutes on each side until golden brown. Drain on paper towels set on a cake rack.

CUCUMBER RELISH

- ½ c. white vinegar
- ½ c. brown sugar
- 1 cucumber, peeled and diced
- 3 shallots, finely sliced
- 2 Thai chili peppers (or other hot peppers), thinly sliced
- 1 T. crushed roasted peanuts

Mix vinegar and sugar until sugar dissolves. Add cucumber, sliced shallots, sliced peppers, and crushed roasted peanuts. Spoon mixture over fish cakes.

SHUTTERSTOCK

The tension serves us all

Two of the most strongly held values in the United States are the public trust concept—the idea that we all have a stake in what is good for society and how our natural resources are managed—and respect for private property rights. Not surprisingly, there is inherent tension between the two.

Society has tried to fairly and equitably balance these sacred principles through federal and state courts and legislation. For instance, even though elk are held in the public trust, a person can't hunt them on someone else's property without the landowner's permission. At the same time, even if elk are mowing down their alfalfa, landowners can't kill elk except during hunting seasons and with requisite licenses and permits.

The state of Montana has also used land-management strategies to reconcile private property rights with public land and wildlife. Wildlife management areas were first established in the 1940s as elk wintering habitat to prevent the animals from overwhelming private ranches. The Block Management Program was created to help private landowners manage public hunting on their property. Conservation easements are a way for the hunting public, via FWP, to pay landowners to protect critical wildlife habitat.

Many citizen-based groups across Montana have found ways to reconcile the private-public tension. The Ranchers Stewardship Alliance, a stockgrower-led organization based in north-central Montana, works on sustaining rural economies and communities while conserving public wildlife, land, and waters. Private property owners and public wildlife groups sit down to hash out disagreements through groups like the Musselshell Watershed Coalition, Blackfoot Challenge, Devil's Kitchen Working Group, Ruby Valley Strategic Alliance, and Big Hole Watershed Committee.

Then there's the 2014 Rocky Mountain Front Heritage Act, a bipartisan bill that added 67,000 acres to the Bob Marshall Wilderness and protected an adjacent 208,000 acres in unique conservation areas that allow cattle grazing and firewood harvesting. The coalition supporting the act included local ranchers and outfitters, state and national wildlife organizations, and businesses and professional groups. A Montana-based bill with similar public-private backing, the Blackfoot Clearwater Stewardship Act, was introduced in 2019 and is making its way through Congress.

Again and again, Montanans have found common ground while respecting private and public rights. Maybe our vast open grasslands and breathtaking mountain scenery tap into deeply shared values of cooperation, trust, and decency. Maybe we recognize that private property rights and the public trust concept are negotiated social agreements created to maximize values like free will, liberty, and the common good. Whatever the reason, we continue to find ways to work together to resolve even seemingly intractable differences. Montanans recognize that "winner take all" is not a sustainable strategy, that it ends with decisions being made, then unmade, again and again, each time political power changes hands.

Yes, working together means compromise. But what's the alternative—stalemate? Endless litigation? When opposing sides draw lines in the sand, everyone just stands there in the sand, doing nothing.

The stockgrower-led Ranchers Stewardship Alliance is one of many examples of how Montanans reconcile the tension between economic liberty at the heart of private property rights and the common societal good that anchors public trust thinking.

FWP is for getting things done. We believe that building collaborative decisions based on authenticity—being true, honest, and present—builds understanding and support for those decisions. Just as important, it makes them durable.

Alternative perspectives and even conflict don't necessarily lead to stalemate. In fact, differences among individuals and groups can force us all to ask hard questions about ourselves and draw on our collective ingenuity to create solutions fair to everyone. Montanans' varied life experiences, abilities, and perspectives are ingredients to lasting solutions that no one individual or group—public or private—could imagine on its own.

In that sense, the tension between property rights and the public trust doctrine serves us well. Being forced to see the world through others' eyes is how we learn, adapt, solve problems, and ultimately thrive as a society. Montanans have shown that providing everyone with a seat at the table—and focusing their collective voices on solving a shared problem—results in more informed and effective decisions, and a better Montana outdoors and economy for all.

—**Martha Williams**, Director, Montana Fish, Wildlife & Parks

AMI VITALE

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Grizzly bear

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TOMMY MARTINO

BEAR TRAINER

JAIMIE JONKEL
FWP Bear Management Specialist, Missoula

WE'RE SEEING MORE AND MORE grizzlies spreading out from their core recovery zones into areas where humans live. In those instances, two types of "bear education" can happen.

The bad kind is when bears learn that being around people and human structures leads to yummy food. Let's say a black bear or a grizzly follows a creek drainage down out of the mountains. The first house or cabin it runs into in the forest can make all the difference. Bears like birdseed, and if a feeder is up on the deck, the bear might crawl up there and also find dog food by the patio door and a barbecue grill covered in grease. Delicious! But this bear has now been trained to associate houses and cabins with food. It takes only one experience for a bear to start craving human-associated treats.

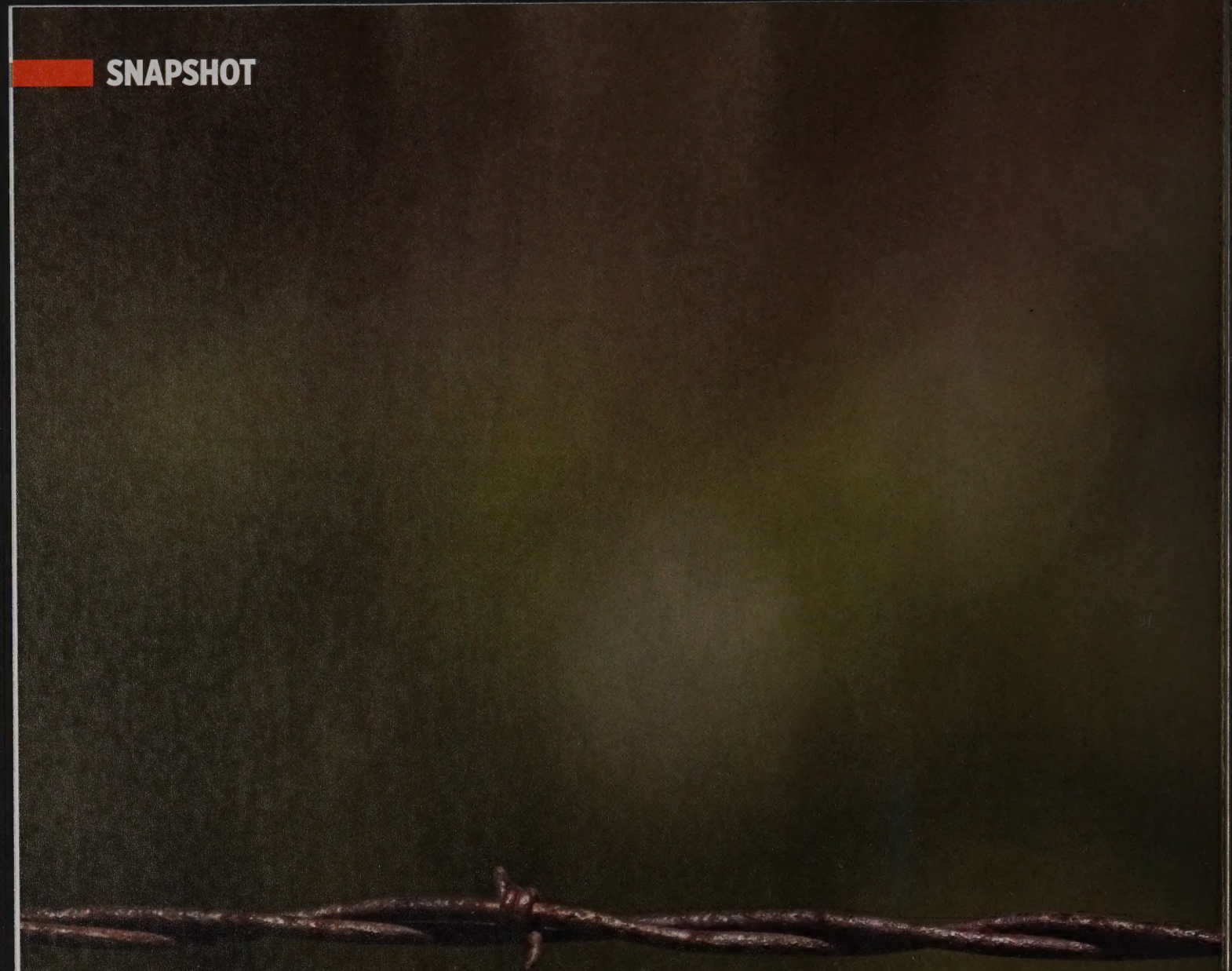
It's like when you take a child to a Dairy Queen for the first time—they never forget the experience and want to go again and again.

When that bear continues down the drainage, it will be even bolder about going into a garage or shed, or even a house. At that point, if the bear poses a safety threat to humans, we might be called in to trap and euthanize it. That's really hard on us, because we know it's not the bear's fault that it became habituated to humans.

Fortunately there's another type of training—the good kind.

That's when we and the people living and working in bear country teach bears that it's not okay to be around houses, cabins, and livestock. We stress the importance of keeping outdoor grills clean, not leaving dog and cat food outdoors, and not feeding birds.

We also promote using electric fence, like the one shown here protecting a garden west of Missoula. These fencing systems aren't too expensive, and Defenders of Wildlife reimburses homeowners 50 percent of the cost (up to $500) in eligible counties. By installing an electric fence around the perimeter of their living area, people who live in bear country can even set out bird feeders, feed their pets on the porch, and hang a deer—so long as it's all within the perimeter. When a bear comes to investigate, it gets a surprising jolt and quickly learns to stay away from fences, buildings, livestock, and people. We call this process, in which a bear is, in essence, training itself, "passive aversive conditioning." It's an example of bear education that's good for everyone, including bears.



Hobby photographer **Tracy Enterline** of Columbus spotted this western tanager last summer while heading home from a trip to Red Rock Lakes National Wildlife Refuge. "I'd seen some the night before in a tree, but they flew off before I could get my camera set up," says Enterline, co-owner of a dental hygienist staffing company in Billings. "When I saw this one, I thought, 'Oh, please don't move.'" The bird stayed put while Enterline took dozens of photographs from her parked vehicle. "It was really perfect, with the rustic barbed wire, the green background, the lighting, and a whisp of wind that picked up those light feathers. I really lucked out that morning," she says.

Photographer and documentary filmmaker **Colin Ruggiero** was driving on Montana Highway 39 a few miles south of Colstrip at dusk when he spotted this thunderhead and accompanying lightning storm. Ruggiero, who lives in Missoula, says he was particularly struck by the shape and texture of the dark weather cell as it hovered over the landscape. "I shoot a lot of time-lapse photography, and dramatic weather cells like this are one of my favorite subjects."

80-90

Miles east of the Rocky Mountain Front that FWP wildlife biologists have recorded grizzly bears in recent years.

Don't eat the watermelon snow

Visitors to Glacier National Park and other high mountain areas often can't believe their eyes when they see what looks like pink or red snow on melting snowfields.

The color comes from countless one-celled algae containing bits of red pigment. According to Joe Giersch, an entomologist with the U.S. Geological Survey, the red pigment helps protect the algae from the sun's intense radiation. As the algae warms from the sun's heat, the surrounding snow melts, feeding the minuscule aquatic plant with water.

The melting snow also concentrates the algae enough to be visible as pink or red and occasionally emit a sweet scent.

This is no snow cone, however. Glacier National Park officials warn that eating snow laced with the *Chlamydomonas augustae* algae can cause stomach distress.

A bumblebee can visit (and help pollinate) 3,000 flowers each day. Bees, butterflies, and other insects pollinate almost all flowering plants and one-third of all food crop plants.

HABITAT THREATS

Insect apocalypse?

The swarms of mosquitoes in your backyard might indicate otherwise, but according to the May 2020 issue of *National Geographic*, insect populations throughout the world are seeing catastrophic declines.

"Where Have All the Insects Gone?" tells the story of a dedicated group of mostly amateur entomologists who have monitored insect abundance at more than 100 nature reserves in Germany since the 1980s. In 2014, the group, the Krefeld Entomological Society, began tracking trends over the previous three decades. What they found was alarming. For instance, in 1989, traps in one reserve collected 17,291 hoverflies from 143 species. In 2014, the traps captured only 2,737 hoverflies from just 104 species. Overall, the biomass of flying insects in many parts of Germany had declined by 76 percent, the group's analysis found.

Other entomologists worldwide are finding similar declines, and some warn that an "insect apocalypse" is under way. A global analysis of 452 species in 2014 estimated that insect abundance had declined 45 percent over the previous 40 years. In the United States, monarch butterfly numbers have fallen 80 to 90 percent in the last two decades. A study in the Netherlands showed that butterfly numbers were down by more than 80 percent over the past century. A recent study of mayflies in the upper Midwest found that populations had dropped by half since 2012.

In Montana, no one knows how the state's insect populations are faring. "Unfortunately, there's never been funding for the long-term monitoring necessary to determine trends," says Mike Ivie, associate professor of entomology at Montana State University.

Documented insect losses elsewhere, however, could be globally catastrophic if they continue. Bees, butterflies, and other insects pollinate one-third of all food crops. Renowned Harvard entomologist E.O. Wilson has said that "if insects were to vanish, the environment would collapse into chaos."

Widespread habitat loss from increasingly intensive agriculture worldwide, and the rapid increase of neonicotinoid pesticides, are causing the decline. According to a 2019 study published in the journal *PLOS One*, neonics, the most widely used pesticides on earth, kill not only pest insects but also honeybees, butterflies, and other beneficial bugs. Neonics remain deadly in the environment for up to three years.

"Plants and insects are the fabric of this planet," Scott Black, an Oregon-based invertebrate conservationist, told *National Geographic*. "We're ripping it to shreds, and we need to knit it back together." ■

CLOCKWISE FROM TOP LEFT: CARTOON BY MIKE MORAN; SHUTTERSTOCK; WIKIPEDIA

YOUTH CONSERVATION

Montana girls build app to save cutthroat trout

Four Kalispell-area students have created an app designed to help anglers protect native westslope cutthroat trout. The girls, ages 10 to 13, developed the web application as part of an after-school program called Code Girls United that teaches girls computer coding and business skills.

"We started the program in 2016 after learning that the number of women in computer science jobs since the mid-1990s has declined by 35 percent," says Marianne Smith, a former Lockheed and NASA engineer who teaches computer science at Flathead Valley Community College. Smith co-founded the all-volunteer program with six other tech and education specialists.

Through Code Girls United, students first learn to build apps using the M.I.T.-developed App Inventor. Next they form teams and choose community-related problems to tackle. "We wanted to do the westslope cutthroat because it's Montana's state fish, and Sylvia had gone on a field trip and learned that it's in trouble," says Amanda Hutchison, 13, who led her team, the Crystal Coders. Teammates are her sister, 12-year-old Trinity (both are homeschooled); Sylvia Blair, 10, of Kalispell Montessori; and Virginia Smith, 12, of Kalispell Middle School.

Adult volunteers assist the teams as they create business plans, conduct market research, develop app prototypes, and write marketing plans. "There's nothing more satisfying to me than listening to fifth-grade girls discussing competitive analysis like it's an everyday concept," Smith says.

Amanda Trinity Sylvia Virginia

The Crystal Coders' app, "Cutthroat Catastrophe," shows users how to identify pure-strain native westslope cutthroat, non-native rainbow trout, and non-native "cutbows" (cutthroat-rainbow hybrids). Montana Fish, Wildlife & Parks encourages anglers to harvest rainbows and hybrids in waters with pure-strain cutthroats to protect the species' genetics. Today, pure-strain westslope cutthroats exist in less than 10 percent of their native range.

The app includes a game for learning to identify the fish, a map showing several lakes in northwestern Montana where the trout live, and a way for anglers to share sightings of trout with other users. "This awesome app is just the type of creative thinking and can-do attitude we need to conserve Montana's native species," says Eileen Ryce, head of the FWP Fisheries Division.

The "Cutthroat Catastrophe" app is not yet available for public use, "but we're hoping to develop it to that state once we figure out how," Amanda says.

By learning about coding and business in a fun setting, the girls gain confidence using technology and presenting ideas. "Hopefully that will encourage them to take computer science and other technical courses in high school and college," Smith adds. "Then they can compete for high-paying tech jobs and be able to stay here in Montana with their families." ■

Listen to the Crystal Coders explain how their app works at youtube.com/watch?v=BBswTYwhK6Y. Visit the Code Girls United website at codegirlsunited.org.

CLOCKWISE FROM TOP: CODE GIRLS UNITED; SHUTTERSTOCK; PUBLIC DOMAIN

Boar's tooth or giant's nose?

When Lewis and Clark set out for the Pacific in 1805, they carried a rough map produced two years earlier by Washington, D.C., cartographer Nicholas King, who based it on native peoples' knowledge of the region. The map showed only five landmarks in what is today Montana. All five are located between Choteau and Helena along a route now known as the Old North Trail, where people had traveled for thousands of years. The map's southernmost landmark, "Boars Tooth," is along the Missouri River a few miles north of today's Helena. This landmark is clearly visible as you drive through Sieben Flats on U.S. Interstate 15. If or when you pass this massive rhyodacite protrusion now known as the nose of the Sleeping Giant, imagine not only the Corps of Discovery members poling their boats up the Missouri on the other side of the landmark, but also the indigenous travelers guided by the "tooth" as they followed this ancient route between Canada and Mexico.

MY SALMONID SEARCH

An angler's quest to catch every one of Montana's nine native coldwater species.

BY TOM REED
ART BY STAN FELLOWS

Bull Trout

It's the water that captures me. It enchants. I cannot look away. I walk along the river, six-weight rod in hand. An observer might wonder what has happened to this wandering soul, who walks the river cobble in his wading shoes, staring at the water as if struck daft by the big, wild country, the crystal river, the grizzly tracks on the sandbars.

Red, yellow, aquamarine, and white—the submerged river rocks are a crayon box of colors. The water revealing the multihued substrate far below is so clear I am tempted to lie face down on the riverbank and dunk my head in its chill and just drink until I cannot swallow another drop.

Then, in a pool that goes from crystal to aqua to midnight, deep down there in the depth, it fins. All two and a half feet of it. Just hanging there in that deep hole. My eyes adjust, sweeping away all else until I can see it clearly, not just a shape as long as my thigh, but a shape that is a fish. I see fins edged with white, and the black back. It's alone.

I have been swinging big streamers all day, walking the cobble, stopping at likely bends in the river. It's more like hunting than fishing.

There is only one river in Montana where you can legally hunt for bull trout, and only for a short time each summer. On the South Fork of the Flathead, deep in the Bob Marshall Wilderness, miles from civilization, bull trout numbers are healthy enough, and anglers few enough, to allow this.

Listed as threatened nationwide more than 20 years ago, bull trout require something that is getting rarer and rarer these days: cold, clean water in consistent abundance. Its historic habitat has been logged, burned, mined, polluted, dammed, and diverted. But here on the South Fork, the habitat is protected by thousands of acres of wilderness, the water cold and obviously clean, and the fish are here. Never many, though. Sometimes only a single large bull in a pool.

As before, this fish is having nothing to do with me. For three days it has been like this. Walk and stalk. Find and fail.

But tonight, for the first time this trip, I'm staying out later, hunting in the witching hour.

That, it turns out, is the secret. A mile below camp, in the fading light of the day, I finally feel a fish take my streamer.

The bull fights deep and strong, using the current. But I pressure it, trusting the tippet, the rod. Then it is by my side, a dark shadow without color in the twilight. I kneel in the shallows, one hand cradling the bull trout's belly, the other around the base of its tail. The fish never leaves the water, and, after removing the hook, I gently hold it there for several minutes until it regains its strength and swims off. I return to camp in the dark, guided by my headlamp, like a successful elk hunter. I'm tired and sore, and by the light of the campfire I tell my comrades the story of the hunt, of what finally worked.

Without realizing it, I have found myself on a quest: Catch all of Montana's native salmonids from native water. I did this accidentally at first, but then purposefully as the goal became clear. Montana is home to 15 salmonids. Nine are native, fish that were swimming here when mammoths and short-faced bears still roamed this land. I wanted to taste just a bit of what it was like "back then." To catch a native fish in its native water is to catch a bit of history.

Sadly, too, it is an increasingly rare experience. Habitat loss, drought, invasive and non-native fish species stocked intentionally and unintentionally, global warming—it's the same old mantra that threatens native coldwater populations across the country.

Yet some special places still hold these special fish. Simply being there is more than half of it.

Arctic Grayling

I'm standing in the middle of the Big Hole River in August. Spruce moths flutter down from the conifers along the shore, landing on the shallow, cold water all around me. The river surface is dappled by Arctic grayling sipping moths struggling in the surface film.

These sail-fin beauties dart and dash beneath the surface, looking like underwater versions of the violet-backed cliff swallows that do the same in the air above the river. They snatch those very same spruce moths, birds and fish mirror images of each other.

These days fluvial (river) grayling are even more scarce than bull trout. Here on the Big Hole where—thanks to collaboration among ranchers, anglers, and others—the water stays cold and flows remain sufficient, a significant native population remains.

As I bend to the water to gently one-hand what is probably my 20th eight-inch grayling of the day, I think about the rare experience of catching rare fish in native water. The fluvial grayling is at extremely high risk of disappearing from the lower 48 states. It's legal to fish for them on the Big Hole, but I think about that fragility and stop fishing. I don't need to catch any more.

Yellowstone Cutthroat Trout

Most of the cutthroat trout that anglers catch across so much of the West aren't actually natives. They are Yellowstone cutthroats, raised and distributed from stock originally from Yellowstone Lake in Yellowstone National Park. As was the case with elk, the park held the last great stronghold of this cutthroat subspecies, which became the preferred "natives" stocked by state agencies. But today, on a stream draining into the park's famous Slough Creek, I'm finally catching Yellowstone cutthroats in their native range.

As with other natives, one cannot separate the land, the drainage, or the water from the fish themselves. Yellowstone cutthroats whisper of grizzly bears on high whitebark pine slopes, wolf tracks on a sandy trail. The sides of this yellow-slabbed fish are peppered as if rolled in cinders of the great volcanoes that made this land. Downstream in Slough Creek, anglers are no doubt catching bigger fish than my friend and I are in this tributary. But we are up here with the eagles and the grizzlies. We spent half a day riding horseback to this spot through a brush-choked, barely perceptible route, in all likelihood last used at least half a century ago. We finally found a good trail to follow for the remainder of our camping trip, and now we're catching these lovely native trout. All is right with the world.

Mountain Whitefish

Being a Western kid, raised on public land and tanned beneath a wide sky, I've caught my share of mountain whitefish, usually when fishing rivers for trout. Whitefish are delicious when smoked and are good fighters, too.

Mountain whitefish live in clear, cold rivers in the state's western half. Usually they take a nymph drifted naturally in the current. But once, at the mouth of Big Creek on the Yellowstone River, I caught a trophy whitefish over 20 inches on a 'hopper fly. They are a symbol of the Wild West, a pure native fish that evolved side-by-side in Montana with westslope cutthroats and have far more business swimming in a Western river than newcomers like German browns, Eastern brookies, and Pacific Northwestern rainbows.

Yes, whitefish are drab colored and slimy and have a face only a mother could love. But for me and most other trout anglers, they have saved many an otherwise fishless day. What's more, because they need clean, cold rivers to survive, mountain whitefish can be indicators of water quality. Populations appear down in some rivers. That has me and many others worried—not only about this true-blue native Westerner, but also about all the other fish—native and not—that swim where the mountain whitefish lives.

Westslope Cutthroat Trout

Except for the mountain whitefish, Montana's most widespread native is the westslope cutthroat. It's also a favorite of mine. The westslope thrives in waters running through the larch forests of the Flathead and Seeley-Swan and the dry sagebrush parks of southwestern Montana, and in the flinty streams along the Rocky Mountain Front. It thrives in varied landscapes, and so do I.

Sadly, pure-strain westslope cutthroats today live in less than 10 percent of their native range. Populations declined after relentless logging and hard-rock mining degraded streams, while overfishing by anglers denuded populations. The combined toll prompted stocking programs of other trout species across the cutthroat's range in the early 20th century. Competition from and hybridization with these non-native rainbow, brown, and brook trout further dimmed their prospects.

My home place for westslopes is a tiny stream in Madison County beneath big peaks that remind me of Alaska. There's a trail here, but the stream is so small that few people stop along the banks to cast into its tiny pools. Many don't even know the creek exists.

In late summer it actually dries up downstream. But walk up the drainage for a mile or two, and you'll start to see more and more water. When you cross the creek for the sixth time, you might start to see small fish dart in the shallows. From here on upstream, find a pool, part the willows, and carefully dap a dry fly onto the surface. Almost surely a west-

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Tom Reed is an essayist and outdoor writer who lives on a ranch outside Pony. Stan Fellows is an illustrator based in Colorado.

slope will take it. The fish will be hungry because the summers here are short. Cutthroats in this creek spend more than half the year under a rime of ice and snow in this tall country. There's a wilted old cabin along the creek's banks, the dwelling of a trapper or prospector. He's gone now, but offspring of fish that were here remain.

Columbia River Redband Trout

Years ago I worked for the legendary hunting and fishing guide Tim Linehan guiding ruffed grouse and dusky grouse hunters behind my setters. Today, Tim and I are in the deepest woods imaginable looking for a tiny native trout called the redband. It looks a lot like a rainbow, but unlike a rainbow, it's native to northwestern Montana and now is found here only in the Yaak Valley.

When Linehan left his native New Hampshire several decades ago and found himself in Montana, he was immediately drawn to forests similar to those of his home. Northwestern Montana's Yaak country drips with water. In the fall, the climate requires thick wool and rubber boots. In the summer, like now, it's a bit warmer, but still wet. The forests are dense. As someone raised in open sagebrush country, I find it claustrophobic.

But then Tim and I see up ahead a tiny stream lit by a shaft of sunlight, like something out of a fairy tale. In a golden pool surrounded by larch and hemlock and other greenery unlike what you find in most of Montana, swims a little fish left over from the retreat of the great ice sheets. It's the redband trout, a pocket comb–size relative of the mighty steelhead that thousands of years ago swam up into this region during annual spawning runs from the Pacific.

For decades, Montana stocked coastal rainbow trout from California stocks in streams containing native redbands. The two species hybridized, making genetically pure redbands increasingly rare. This stream, with barriers downstream that prevent rainbows that aren't redbands from moving upstream, is one of the few where the pure-strain natives exist.

Kneeling to stay hidden, and with only a few feet to backcast without snagging the trees behind me, I manage to sling a tiny Adams dry fly onto the water surface. The current quickly grabs my floating line, dragging the fly. I try again, and this time the Adams floats without drag just long enough for a fish to sip it. I gently lift and the trout is on, dancing against my ultralight rod. Soon I have my first native redband in hand. Tim claps me on the back, and we sit back in the shade of these deep woods, happy to be in such a magical place.

Lake Trout

When the great ice sheets retreated from this region, they stalled just enough in a few places to leave a nice lake or two. Four of those lakes—two in Glacier National Park and two in southwestern Montana's Centennial Valley—are the only waters in Montana where lake trout are native.

On one of the Centennial Valley lakes, in a strong tailwind, I am trying to slow the boat enough to get a good drift for trolling. We've been fishing all day, going from one end of the lake to the other, again and again, trolling deep. Somewhere down there is a lake trout, I promise my partner. She sits in the bow, patiently dealing with the kids, a spinning rod with 100 feet of line out, and my boating skills in this wind. We make another circle. Once, a rod tip dips down, but when we lift up, there is nothing there. Maybe the lure just ticked bottom.

Lake trout have been stocked legally in several large, deep lakes and reservoirs, like Flathead and Fort Peck. They were also illegally stocked in Yellowstone Lake in Yellowstone National Park, where they have devastated the native Yellowstone cutthroat trout population. Here on this lake, where the fish have always been, I want to catch one badly enough to row all day. At the boat dock at day's end, I tell the lodge manager what we are doing. Ah, he says, you are here at the wrong time. Come back in the spring right after ice-out, when they are up in the shallows and much easier to catch. Now he tells me.

Pygmy Whitefish and Lake Whitefish

These last two native salmonids have also eluded me. I fished for pygmy whitefish for hours in a river where I'd heard they swim. I later learned that these rare, five-inch cousins of the mountain whitefish live in deep, cold lakes. No wonder I whiffed.

Then there's the lake whitefish. I recently learned that these larger cousins of mountain and pygmy whitefish are native only to two lakes—St. Mary and Upper Waterton—found in the small portion of the Saskatchewan River watershed that dips into Montana at the northeastern corner of Glacier National Park. Apparently they can be caught from the shore of St. Mary at the lake's outlet using dry flies, or small spoons with spinning gear.

Look for me there this summer.

DELICATE DAZZLER The Melissa blue butterfly lives throughout Montana in wet meadows, moist streamsides, open woodlands, parks, and gardens.

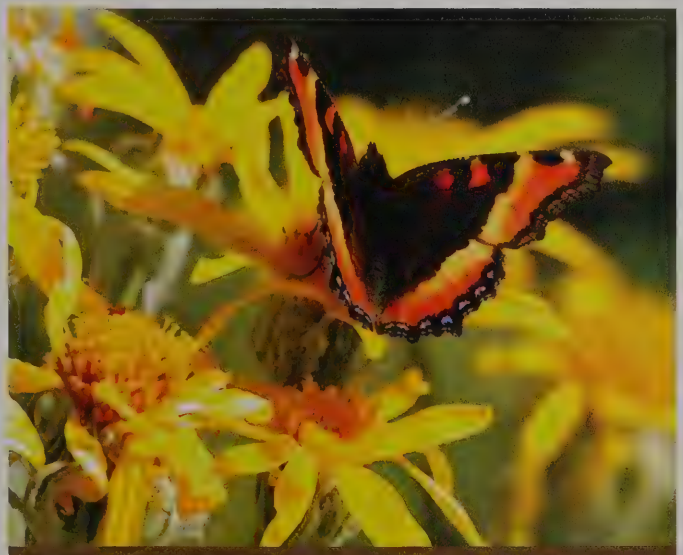
FLOATING FLOWERS IN THE SKY

The challenge and importance of counting butterflies. By Shane Sater

The parking lot at the main Rattlesnake trailhead near Missoula is bustling this July morning. An unusual group has gathered at one end, carrying insect nets, field guides, and binoculars. These butterfly watchers are taking part in the annual Five Valleys Butterfly Count. With a forecast for sunny skies and highs in the upper 70s, the weather looks promising. "Butterflies are solar-powered. They need sunlight to warm them up so they can fly," says Kristi DuBois, a former regional Nongame Wildlife Program coordinator for Montana Fish, Wildlife & Parks who has led this count for the past 12 years.

Our goal is to identify all the butterflies we see. A few species are easy to distinguish, even at a distance. Others are much harder. Using light mesh bags on four-foot handles, the plan is to catch, examine, and release.

Butterflies are surprisingly wary. Netting them requires stealth and lightning-quick reflexes. In the dappled light of a small meadow, I spot one resting on a wildflower. I swing my net and quickly twist the handle to close the bag. The butterfly flutters inside, uninjured though no doubt surprised. Another participant helps me gently transfer it to a collapsible mesh box. Through the plastic viewing window, the butterfly is gorgeous, with a flame-colored band running along the back of its black wings. DuBois identifies it as a Milbert's tortoiseshell, an uncommon species this time of year, she says. We mark it down in a notebook and let it flutter away.



The Milbert's tortoiseshell is a common Montana butterfly found statewide in gardens, parks, wet meadows, and moist streamsides.

LEFT TO RIGHT: RICHARD J. JACKSON, JESSE LEE VARNADO

BUTTERFLY BASICS

Butterflies are shape-shifters. Each starts life as an egg, hatches into a voracious caterpillar, rests as a comatose pupa, then transforms into a winged wonder.

Montana hosts roughly 200 butterfly species of remarkable diversity. Many survive just a few weeks as adults, while others may live as long as eight months. Some spend the winter as eggs or pupae. Others hibernate as adults, one-fifth of a gram of insect somehow surviving Montana's brutal cold. A few, like the monarch and painted lady, can migrate hundreds of miles in spring and fall to and from southern wintering areas.

Plants, consumed in the caterpillar stage, are essential for butterfly development. Some butterfly caterpillars are generalists, feeding on a variety of vegetation. Others are specialized. The Milbert's tortoiseshell

Shane Sater is a biology student at Carroll College in Helena and a part-time employee with the Montana Natural Heritage Program.

I caught likely grew up eating nettles. The Rocky Mountain dotted blue, a tiny meadow gem, eats only buckwheats—from a single genus of native plants. Other species consume junipers, lupines, mustards, violets, willows, and grasses. "If you don't have the right larval food plants, you won't have butterflies," DuBois says.

Most caterpillars end up as food for something else. "They're full of fat and are very nutritious," DuBois says. Many songbirds, even seed-eaters like lazuli buntings, fatten their nestlings on caterpillars.

As for adult butterflies, most survive on flower nectar sipped with their tongue, which works like a straw.

A butterfly, which the British poet Rudyard Kipling called "thou winged blossom," gets its colored wings from millions of tiny scales that reflect light in different ways. The category of butterflies known as blues are sky-blue or brownish, quarter-size, and abundant. Sulphurs are yellow and fly quickly. Wood-nymph butterflies wear brown camouflage with unexpected bullseye markings under their wings. Swallowtails are large, striped in black and yellow.

In the Missoula-area meadows, today's volunteers find dozens of orange butterflies in the skipper family—all tiny, active, and triangular winged. Most are the accidentally introduced European skippers. They showed up around Missoula sometime after 2002, and in recent years have become one of the most commonly observed species on the Five Valleys count.

Sunny skies bring out the butterflies. As longtime butterfly counter Jim Brown of Missoula says, "So much of their life is inconspicuous." Eggs, caterpillars, and pupae live out of sight of most people. Even as brightly colored adults, butterflies take cover if it's cloudy, rainy, or cold. "What you find on a given day depends so much on the weather," Brown says.

Some months are better than others for viewing certain species. In early June, for instance, Brown sees many spring azures. "But by July they're very uncommon at this elevation," he says. Other butterflies, like the woodland skipper, are just starting to appear in July. In another month, they'll be common and eventually disappear from sight.

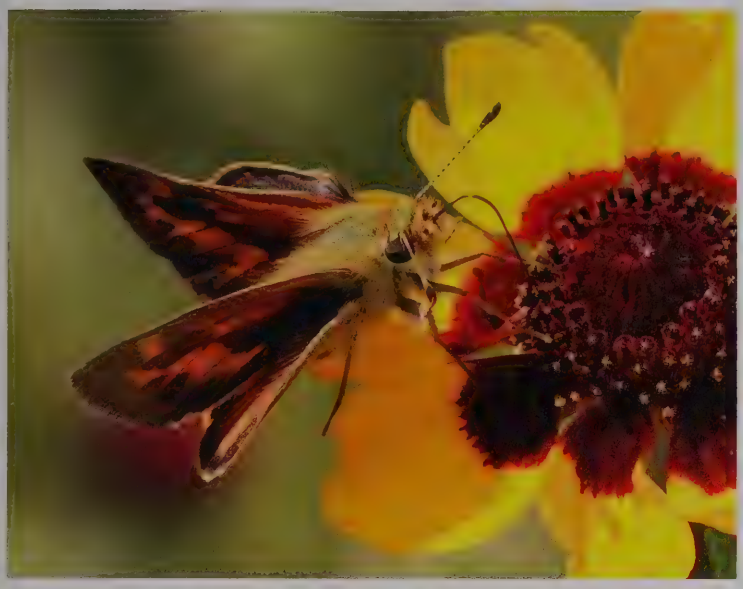
NUMBERS GAME In the Missoula area, and at the MPG Ranch, Glacier National Park, and Yellowstone National Park, volunteers count different species of butterflies each summer. The counts, along with hundreds of others nationwide, are coordinated by the North American Butterfly Association. Information from the surveys helps scientists understand population trends and identify threats to butterflies.

WHERE TO FIND THEM

A few clouds are moving in, but the air above the meadows remains busy with butterflies. The winged insects seem to dwindle along stretches of trail where trees, and shade, close in. The key to finding abundant butterflies is to seek out sunshine and diverse host plants, DuBois says. Recently burned forests, where fire was not too severe, are usually great sites. "The first few years after a fire you get all this sunshine and, with it, a big flush of shrubs, forbs, and grasses—all excellent butterfly food plants," she explains.

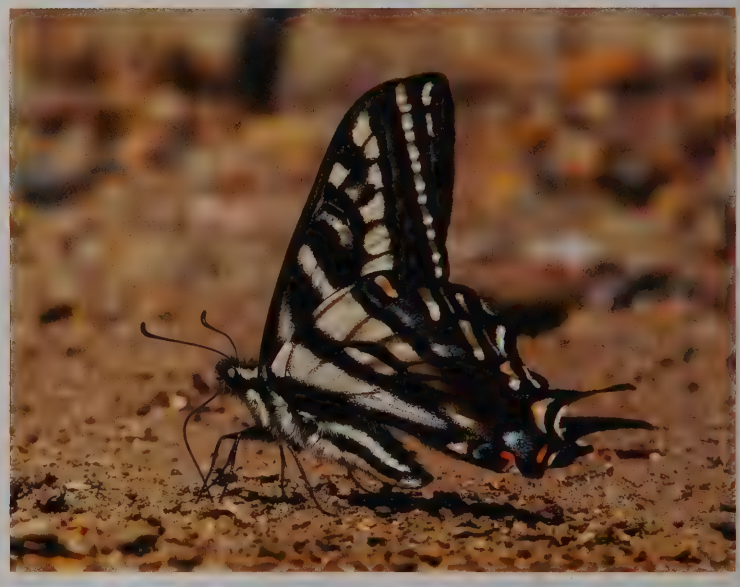
Meadows, streamsides, and edges between different habitats are other likely spots. Males concentrate on hilltops and in

PHOTOS: MARIPOSE KUHLMAN



(CLOCKWISE FROM TOP LEFT: DOMINICK SPERANZA; STACY THORNBROUGH; GAIL MOSER; DOMINICK SPERANZA; JESSE LEE VARNADO; ELIZABETH MOORE)

COLORFUL CROP SUSTAINERS Butterflies are essential pollinators. From alfalfa to apples, pollinators are key to the production of about 150 food crops worth an estimated $10 billion in the United States each year, according to the U.S. Department of Agriculture. Montana is home to roughly 200 butterfly species. Clockwise from top left: woodland skipper, cabbage white, mourning cloak, anise swallowtail, Christina sulphur, and Boisduval's blue. Many survive just a few weeks as adults, while others may live as long as eight months.



DAZZLING COLORS Butterflies are covered in millions of tiny scales that reflect light in different ways to produce the insects' vibrant and diverse colors and patterns. Part of the beauty of butterfly sightings comes from the flowers that they move among, feeding on nectar sipped through their strawlike tongue. In their caterpillar stage, butterflies eat plants—often only specific species—growing fat and providing nutritious food for birds and other wildlife. Clockwise from top left: Weidemeyer's admiral, spring azure, snowberry checkerspot, pale swallowtail, gray hairstreak, and painted lady.

CLOCKWISE FROM TOP LEFT: PAUL LALLY; RANDY BEACHAM; CAROL POLICH; AARON BARTOSIK; DOMINICK SPERANZA; DAN ELLISON

ravines searching for mates. Other males fly up and down a trail, patrolling a territory. Since most adult butterflies feed on nectar, flowers are good places to check. Mud puddles also attract surprising numbers—yes, butterflies get thirsty. Some species also gather on cowpies and wild animal scat.

DuBois points out that butterfly habitat is changing in the Missoula foothills. Noxious weeds have displaced native grassland wildflowers such as lupines and violets. Forest openings and grasslands, historically kept open with wildfire, are filling in with young Douglas firs. For thousands of years in the Missoula area, DuBois explains, fires periodically raced through forests, creating a mosaic of open and treed areas. "You'd have seen more grasslands, more meadows, and also more old-growth forests."

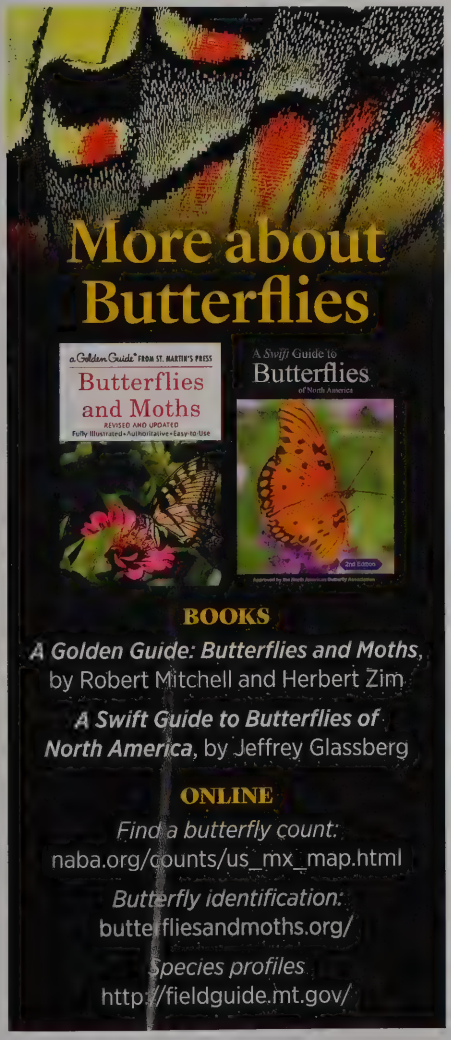
Ancient trees were less likely to ignite in the fast-burning fires that shaped the region. Now young and middle-aged forests have increased. That's been better for some wildlife—elk, for instance—but worse for others, like butterflies. "The whole butterfly habitat picture is related to the whole wildlife habitat picture," DuBois says. While hundreds of native insect species have suffered from the habitat changes wrought by lack of fire, most invertebrates are difficult to see. "But butterflies are a highly visible part of the invertebrate community," DuBois says. "They're easy to monitor."

THE IMPORTANCE OF COUNTING

In 2013, botanist and butterfly enthusiast Marirose Kuhlman started a butterfly count at the MPG Ranch near Florence. The annual events have become both social and scientific. "Not only do they provide good information, but it's a great way to connect with other people and get better at learning. Some counters attend every year," Kuhlman says.

Butterfly counts also take place at Glacier and Yellowstone National Parks, part of the roughly 450 counts across North America each summer coordinated by the North American Butterfly Association (NABA). The summer counts are a butterfly version of the annual Christmas Bird Survey run by the National Audubon Society. The NABA's yearly reports include important information about the geographical distribution and relative population sizes of butterfly species. By comparing results across years, scientists can monitor butterfly population trends and study the effects of weather and habitat alterations on various species.

"Like with managing all wildlife, annual population monitoring is vital for butterflies," DuBois says. "They're definitely fun to look at, but it's important that we count them, too."



The variegated fritillary is found in parts of Montana in fields, grasslands, pastures, and open woodlands. In North America, the species ranges from central Saskatchewan to central Mexico.

MARIROSE KUHLMAN

KARL KRIEGER

In-Between Bears

Communities and FWP adapt as grizzlies spread from their two primary recovery zones into historic habitats. By Tom Dickson

Reports of grizzlies raiding beehives, startling hikers, or nosing around cabins near Whitefish, Gardiner, and other communities next to Glacier or Yellowstone National Parks are no longer surprising.

But similar reports near the Big Hole Valley, Helena, Butte, Stanford, and Dillon—all 100 miles or more from the national parks and surrounding grizzly recovery zones?

That's news.

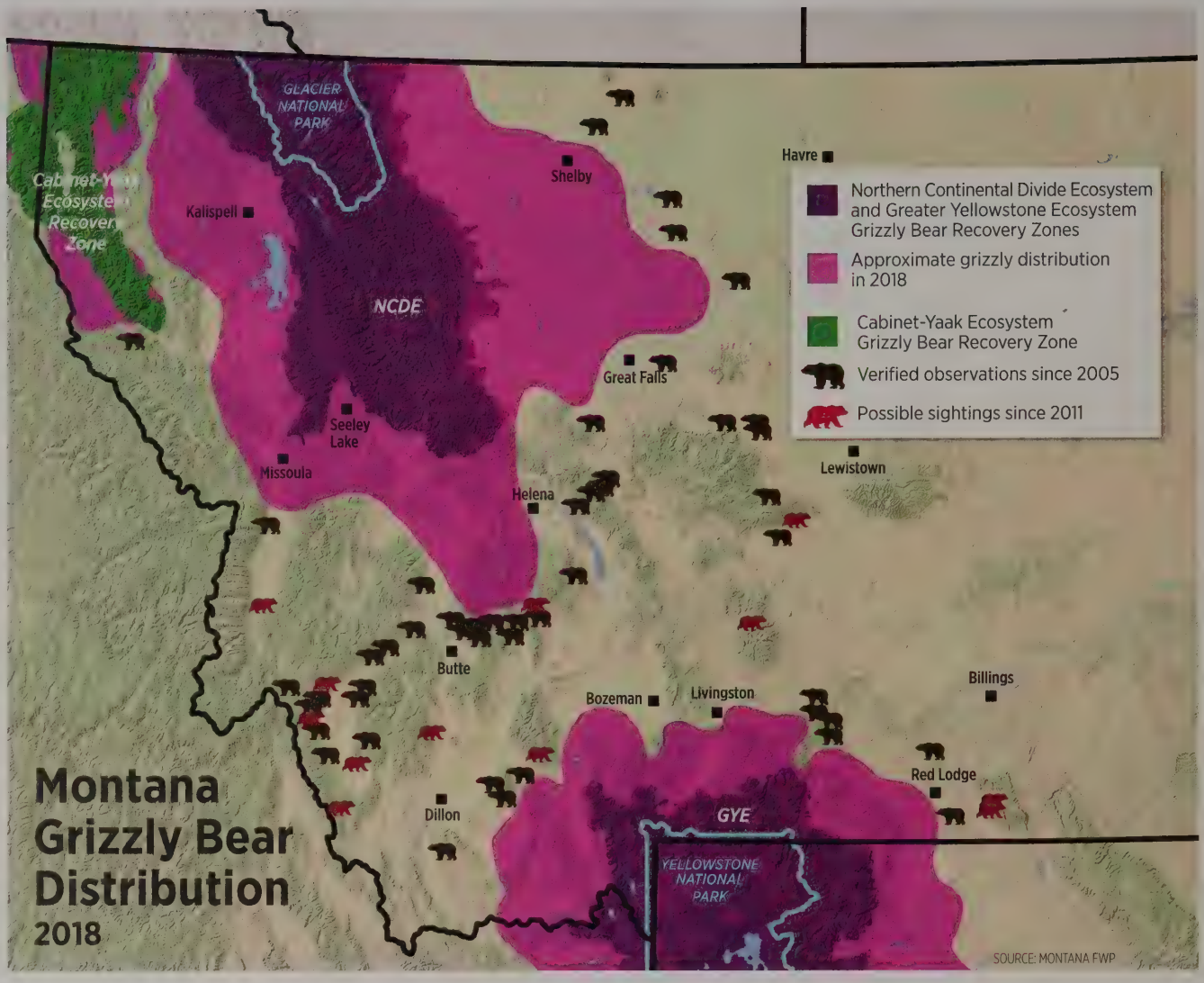
"We've long known that grizzlies do very well in large, remote landscapes like the Bob Marshall or Absaroka-Beartooth Wilderness Areas. Now they're showing us they can live in many other places, too," says Cecily Costello, bear research biologist for Montana Fish, Wildlife & Parks in Kalispell.

For example:

- In 2016, for the first time since the early 1900s, a grizzly was spotted in the upper Big Hole Valley.
- Since 2016 there have been regular reports of grizzlies in the Elkhorn Mountains south of Helena.
- For the past three years, hunters and hikers have found grizzly tracks in the Elk Park–Bernice area north of Butte.
- In 2017, FWP euthanized a pair of male grizzlies near Stanford, halfway between Great Falls and Lewistown, after they killed several calves. It was the farthest east of the Rocky Mountain Front that grizzly bears have been recorded in more than a century.
- In 2019, a grizzly charged two hunters in the Beaverhead-Deerlodge National Forest near Dillon.

According to Mark Haroldson, a U.S. Geological Survey wildlife biologist, grizzly bear populations have filled the original recovery areas in the Northern Continental Divide Ecosystem (NCDE) around Glacier National Park and the Greater Yellowstone Ecosystem (GYE) around Yellowstone National Park. When grizzlies were listed as a federally protected species in 1975, the NCDE and GYE had an estimated 700 grizzlies combined. Today the estimate is 1,000 to 1,200 and 750 to 1,000, respectively—at least triple the 1975 populations. "These two recovery areas have reached their carrying capacity for grizzlies," says Haroldson, a member of the Interagency Grizzly Bear Study Team. "Now new generations of bears are spreading out into habitat that seems to suit them."

Costello notes that while grizzlies can be inconvenient for people living, working, and recreating in these areas, the population expansion is a conservation success story. "Grizzlies are doing very well in Montana," she says. "In large part, that's because most Montanans



support grizzly conservation and have learned to coexist with bears." By expanding between the NCDE and GYE, bears in the two populations might eventually begin breeding. Otherwise the two "island" populations will eventually lose genetic diversity necessary for long-term survival. "That connectivity would be very important in sustaining the future health of both populations," Costello says.

The original recovery zones were established around Glacier and Yellowstone because they contained large blocks of public land and few private livestock operations, Haroldson says. "For decades, we've thought of grizzlies in remote landscapes far from cattle and communities," he says. But as grizzlies have saturated the two recovery zones, they increasingly spread into areas where they lived before European settlement. "They're showing us that private land is also part of the habitats they can use."

Even a few grizzlies from the smaller Cabinet-Yaak Recovery Zone have wandered around western Montana.

The growing number of "in-between" bears has required adjustments by FWP, says Ken McDonald, head of the department's Wildlife Division. "Our challenge is to try to get ahead of the bears and work with landowners and local communities to reduce attractants before conflicts happen," McDonald says. "We've learned that if we can prepare people to start practicing smart food storage and livestock protections ahead of time, we can reduce conflicts with grizzlies if they come near a cabin or a ranch."

Grizzlies aren't the only concern. As more people build and recreate in mountain forests and foothills, conflicts with black bears have increased, too.

With strong support from the Montana Legislature, FWP has increased its number of bear management specialists. Recent positions have been added in Valier, Red Lodge, and Anaconda, in addition to specialists in Libby, Kalispell, Missoula, Bozeman, and Choteau. "The key to grizzly conservation is to build local tolerance," McDonald says. "The specialists do that by educating the public on conflict prevention. If a bear does start causing problems, they move in quickly and try to resolve the issue before it reaches a point where it has to be killed."

The spread of bears has required other adjustments as well, says McDonald. "For more and more ranchers, it means having to modify operations to reduce possible conflicts, like using electric fence around calving corrals and sheep pens."

According to Costello, the growing number of new sightings shows that private lands provide essential connectivity habitat as the bears move among public lands and mountain ranges. "Ranchers, especially, are being asked to tolerate more and more inconvenience and even economic loss because of bears," she says. "Their tolerance, along with the connectivity habitat on their land, is becoming a major contribution to grizzly conservation in Montana."

Tom Dickson is the editor of Montana Outdoors.

HOW HOT IS IT?

By Bruce Auchly
Illustration by Ed Jenne

Here's nothing new: It's been hot recently.

How hot? So hot, I saw a dog chasing a cat and they were both walking.

So hot, I'm being forced to use passive verbs.

Okay, for those who suffer from the heat, high temperatures are no joke. But maybe nature can teach us a few coping tricks.

In late summer, prairie amphibians like the Great Plains toad take refuge underground, waiting out the heat wave. All amphibians begin their lives in water, developing from eggs to swimming larvae (tadpoles) to adult frogs, toads, or salamanders. After that, adult frogs stay in or near permanent water sources. Most toads and salamanders are more tolerant of dry conditions, but they still need some wet habitats.

Because amphibians have weak lungs, they also breathe through their skin, which can happen only if their bodies are moist. And in the dog days of summer, there's not much moisture on the surface of Montana's prairies.

So, toads and salamanders must find or dig a moist burrow. Then they wait for night or rain to emerge and seek insects. See, it's not just teenagers that sleep in the basement all day and only come out at night.

As for insects, by late summer mosquito season has peaked and waned, and grasshoppers are numerous and breeding. Anglers know to put a 'hopper on a hook or use an imitation to catch a trout.

Most grasshoppers breed in late summer and die before winter. Remember the Aesop's fable about the ants and the grasshopper? The one where a starving grasshopper in autumn asks a family of ants for a bite of food. Forget it, the ants say, you played all summer while we worked. I think there's a lesson here. But, ouch.

Anyway, grasshopper eggs overwinter in the soil. Then, depending on the species, they hatch in spring and summer, just in time for hungry prairie songbirds and their nestlings to devour. Thank you, frivolous grasshopper.

Bruce Auchly is the FWP regional Information and Education Program manager in Great Falls. Ed Jenne is an illustrator in Missoula.

Speaking of birds, by late summer many have already headed south for the winter. Those still here are rarely active at midday. And if it's too hot, some birds get rid of extra body heat by panting, expelling warm, moist air from overheated internal tissues.

The common nighthawk (a bird though not a hawk) uses a peculiar method to beat the heat. It goes into a deep sleep, called torpor, almost like a summer hibernation. To avoid predators, this relative of the whip-poor-will of the South relies on its camouflage to hide while slumbering in the heat of the day.

In late summer, mammals become nocturnal, quiet by day and active at night. Think bears and raccoons. That's not difficult to understand: What would you do while wearing a fur coat this time of year?

Many mammals now wear a summer coat, different from their wintertime garb. For example, white-tailed deer shed their thick winter hair and replace it with thinner reddish-brown hair. By the early fall, their winter hair grows through the summer coat to create a gray or grayish-brown coat.

Elk are similar. Right now, they sport their summer hair, a deep reddish-brown with little or no undercoat, giving them a sleek look. But their winter coat has started to grow already, and by early September, they will begin changing into their darker, thicker attire.

Perhaps nature offers a clue on how to stay cool until fall: Work at night and wear lighter clothing. Or just suffer through it, remembering how cold you were six months ago.

CALMING

How FWP game wardens keep boaters safe—sometimes even from themselves

By Brett French
Photos by John Warner

THE INFLATABLE POOL FLOAT, with its collapsible sides and Loch Ness monster neck that ends in a unicorn head, is not the typical watercraft you'd expect to see carrying four people on one of Montana's largest rivers. But this warm July morning on the Yellowstone River is no typical day.

Accompanying this and other inflatable toys are rafts, kayaks, and inner tubes plowing through or bobbing over a set of rapids known as Four Banger. Named for four large and distinct waves, these rapids just downstream of Big Timber form some of the most turbulent—and dangerous—whitewater on the lower Yellowstone. Some floaters, doused by the cold waves breaking over their heads, raise a fist in celebration. Shouting loudly to onlookers onshore, they holler "Boat Float!" The beached boaters echo their call, hooting and cheering.

Other floaters have a tougher time negotiating the waves and four-foot-deep troughs, which buck them into the water or flip their craft. Coolers, sandwiches, sunglasses, and beer cans are swept into the current. When they surface from the sudden submersion, the floaters' expressions often convey fear mixed with shock at how intensely cold the water is, even on this sunny midsummer day. Fortunately for them, Montana Fish, Wildlife

HELPING HANDS As the crowd builds for the annual Yellowstone Boat Float, FWP game wardens Paul Luepke and Derek Fagone patrol the water downstream from Four Banger rapids near Big Timber. Many boats capsize in the whitewater.

THE WATERS

& Parks game wardens Paul Luepke and Derek Fagone are standing by.

"The challenge is deciding which people need help and then scooping them out of the water as fast as possible," says Luepke, who works from nearby Columbus. "It's difficult managing the boat in this fast current."

Ordinarily, game wardens don't patrol Four Banger. On a normal summer day, maybe a dozen boats would run this section of the Yellowstone. But this is the annual Yellowstone Boat Float weekend, when hundreds of revelers float from Livingston to Billings over three days each July. Many participants safely ride in aluminum-frame, self-bailing whitewater rafts, but some lounge in inflatable swans, party islands, and tanning floats designed for swimming pools.

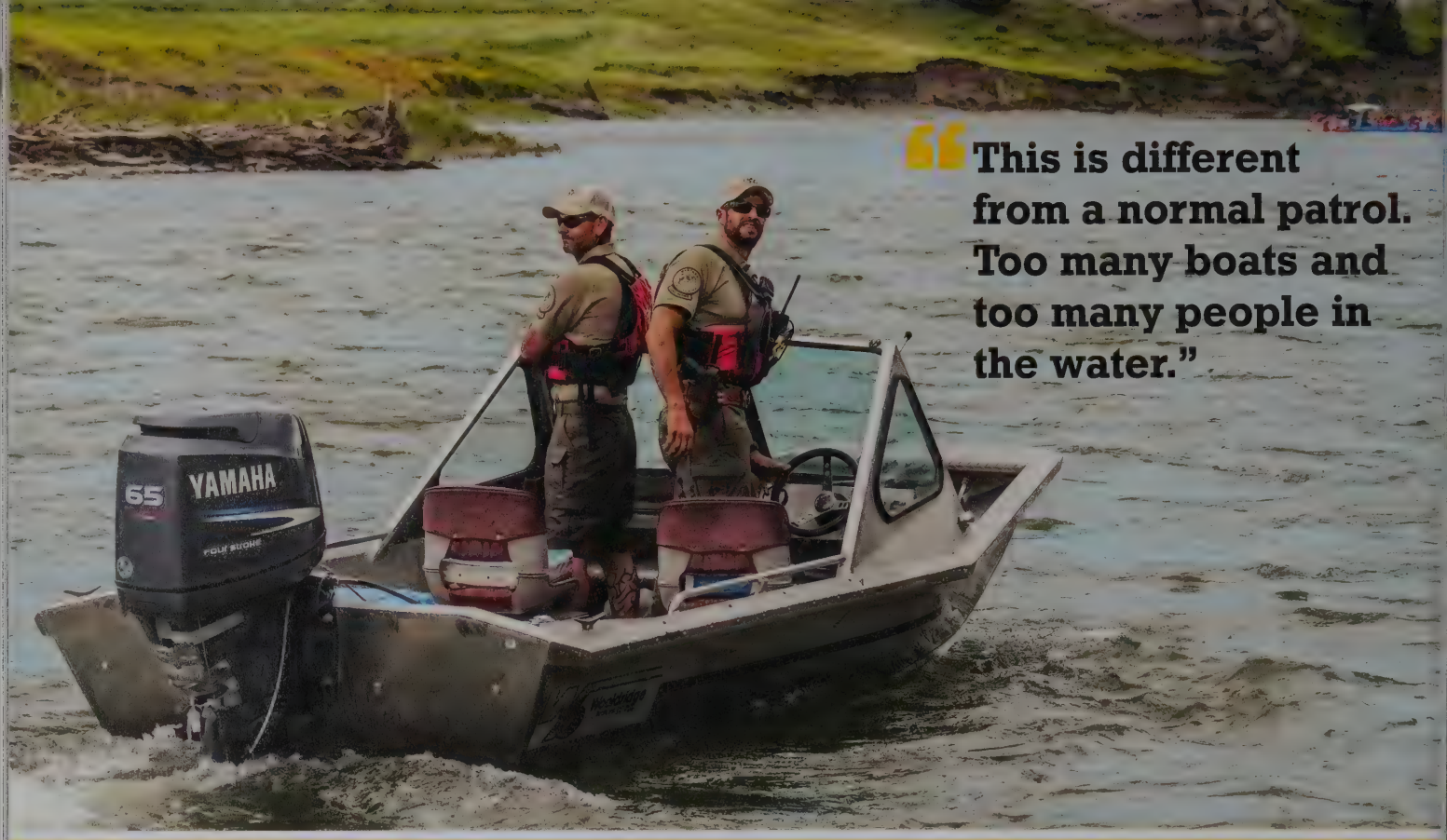
The wardens' priority is to keep people from drowning. "This is different from a normal patrol," says Fagone, who works from Big Timber. "We don't even have time to check for life jackets. Too many boats and too many people in the water."

When they aren't pulling people from the river, Fagone and Luepke shout out advice. They point out that one of the worst ways to float moving water is tied to another rig. "It's almost impossible to maneuver boats, inner tubes, and pool toys when they're all connected," says Luepke. "If one hits a downed tree or snag, all the other floaters can get dragged in."

A major concern of the wardens is that many floaters view the rapids as a Disney-type ride. "They start out okay when they capsize," Luepke explains, "but when they don't have a life jacket, it's not long before they're exhausted and struggling. That water is cold and it's fast."

Constant policing required

The Yellowstone Boat Float is an extreme example of the challenge that FWP wardens



"This is different from a normal patrol. Too many boats and too many people in the water."

READY FOR RETRIEVAL Fagone (left) and Luepke (right) watch as boats, rafts, kayaks, and other watercraft tumble through the Four Banger. The rapids are among the largest on the lower Yellowstone and the epicenter of the floating party that surrounds the annual Yellowstone Boat Float. Though the July event is not a typical weekend on the Yellowstone, say the wardens, the work they do keeping boaters safe exemplifies what they and other wardens do elsewhere on Montana rivers, lakes, and reservoirs each summer.

face to keep boaters safe. The potentially dangerous combination of inexperienced operators and unsafe watercraft crops up every summer across Montana. Large lakes and reservoirs like Canyon Ferry, Flathead, and Fort Peck attract hundreds of boaters on a single summer day. That requires constant policing to ensure that people on and in the water don't end up injured or worse. "I spend pretty much the entire summer on a boat," says Josh Leonard, a Townsend-based warden who patrols nearby Canyon Ferry Reservoir.

Game wardens routinely check to see that all watercraft have a wearable Coast Guard–approved personal flotation device (PFD) aboard for each person on board. Boats 16 feet and longer are also required to carry an additional throwable flotation device. Wardens stop boats to check boater registration and registration decal displays, and make sure underage children aren't operating boats and that motorboat operators aren't under the influence of alcohol or drugs. They also enforce laws that prohibit boaters from driving too close to dams, or entering restricted areas set up to protect swimmers, divers, and wildlife such as loons and waterfowl. "We make sure that people know what the rules are and follow those rules to keep people safe," says Phil Kilbreath, FWP's boating law administrator.

Accessible for more people

That job is getting tougher each year, as the variety of water-based activities increases. According to a 2019 report by the National Sporting Goods Association, "Open water sports and outdoor activities have experienced consistent increases over the last three years." Smaller craft like stand-up paddleboards (SUPs) and fishing kayaks make water-based recreation accessible for more people. In addition, fishing remains one of the most popular outdoor activities in Montana, and many anglers fish from boats.

Kilbreath says Montana has 80,000 to 100,000 registered boats and up to five times more nonmotorized craft—for an estimated total of 400,000 to 500,000 watercraft.

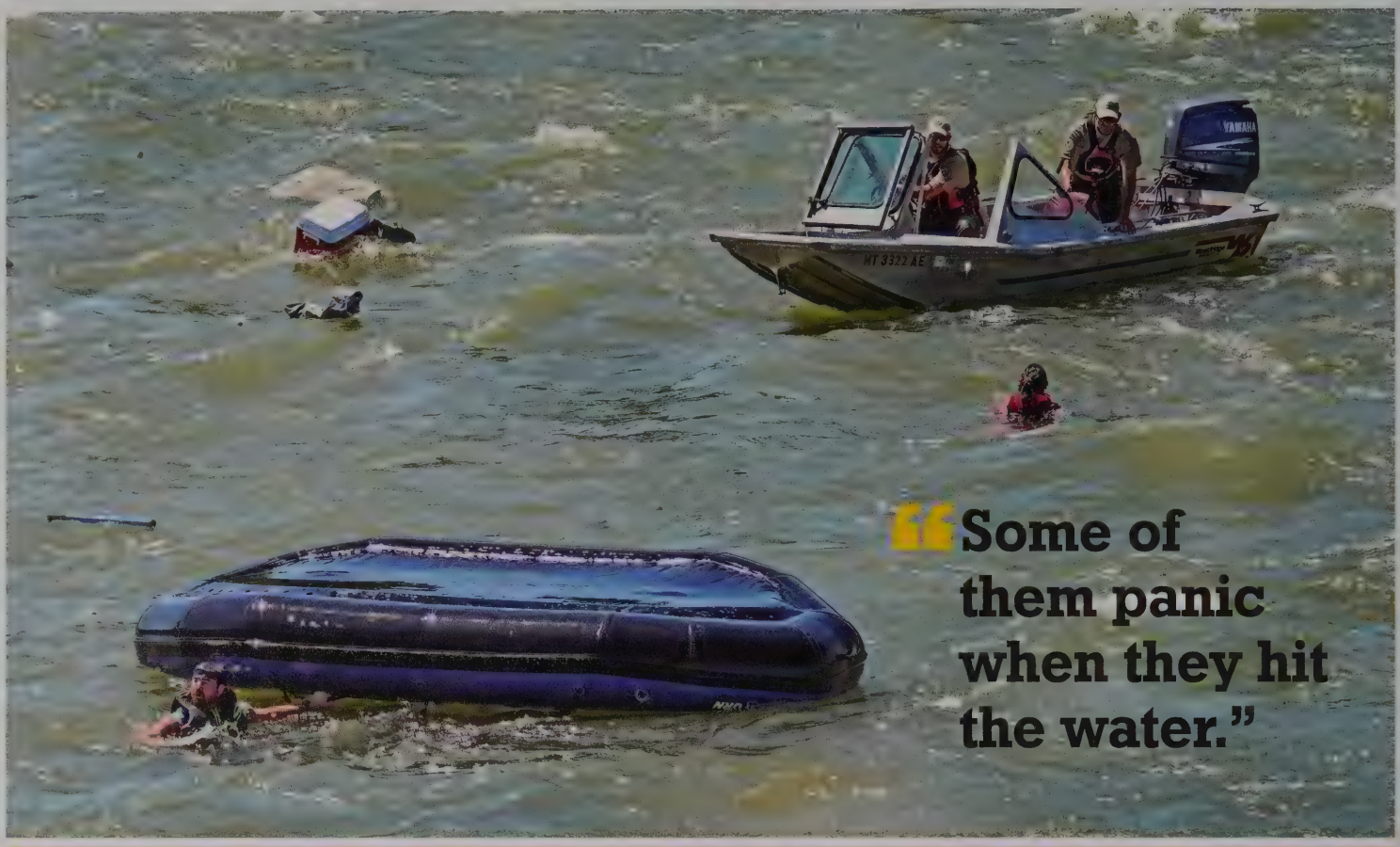
Despite the growing number of people on the water, FWP wardens have helped keep per capita fatalities low compared to other states. On average, Montana records roughly 25 boating accidents a year, about 8 of which result in fatalities. By comparison, roughly 200 people die in vehicle accidents in Montana each year. "The number of people using the water increases every year, but the number of accidents is stable," Kilbreath says. "So we're holding steady against the tide."

FWP posts 100 game wardens on the water each summer. Another 65 volunteer members of the U.S. Coast Guard Auxiliary also patrol major reservoirs and lakes. The 32,000-strong all-volunteer auxiliary is part of the U.S. Coast Guard "family" and promotes recreational boating safety on inland lakes and reservoirs nationwide.

Ongoing training and workshops help, too. Using federal funds, FWP and the U.S. Coast Guard Auxillary conduct safe-boating workshops at schools, businesses, and events. FWP also partners with other state

Brett French is the outdoors editor of the Billings Gazette. *John Warner is a photojournalist in Billings.*

FLIMSY FLOATERS Above: Passengers in a professional-grade raft make it through Four Banger. Others won't be so lucky. With the increasingly lower cost and greater availability of inflatable pool toys (below left), more and more people are putting the devices on rivers and reservoirs—and putting themselves in danger, according to FWP game wardens. "They just aren't made for a big river like the Yellowstone or a reservoir like Fort Peck where big winds can blow up anytime," says Luepke. Below right: Floaters riding a seaworthy raft and wearing life vests demonstrate how to have a good time while staying safe.



OVERBOARD The human and plastic contents of a raft that flipped at Four Banger swirl in the cold, deep current as Fagone and Luepke carefully but quickly approach to rescue the passengers. Josh Leonard, a Townsend-based warden watching nearby from his own FWP boat, says that the combination of cold water and powerful current can cause people to panic and struggle, increasing the chances that they breathe in water. "If they'd just relax and go with the flow, they'd be far less likely to drown," he says. Below: Fagone reaches for a boater tossed from his raft below the rapids. "It's a good thing he was wearing his life jacket," the warden says later. "Otherwise they are extremely hard to fish out of the river."

TO THE MAX Thrill-seekers push their limits on Four Banger. Most boaters make it through the turbulent whitewater, but if they don't, Fagone and Luepke are standing by to help.

conservation agencies across the West to coordinate boater safety training and education materials, and to recommend policy to the U.S. Coast Guard. "It's a concerted effort to improve boating safety across the region," Kilbreath says.

A growing challenge is the accessibility of inexpensive kayaks and paddleboards, says Sara Smith, education coordinator for FWP's Recreational Boating Safety Program. "They're affordable, fairly easy to learn how to use, don't require a trailer, and there's no maintenance," she says.

Smith notes that neither training nor certification is required to use a kayak, canoe, SUP, or sailboat. Children ages 13 and 14 must take an FWP boating safety course to operate a boat or personal watercraft like a Jet Ski by themselves, but training isn't required for older teens or adults. "We still encourage all boaters to take our online boating education classes," Smith says. "It provides tons of great information on laws, regulations, safety, and just general boating know-how."

Smith helps newcomers learn the basics before taking to the water. After "wear your PFD," her No. 1 piece of advice: "Until you gain some experience, do your first floats with people who know what they are doing." Other tips include checking the weather forecast to avoid lightning and high winds, and understanding the threat of hypothermia—even in summer. FWP offers a free boating education pamphlet with advice on motorboat registration, what to do in an emergency, items you should carry on your boat, and navigation rules. Obtain one from Smith by calling her at (406) 444-5280 or download it from the FWP website at fwp.mt.gov/recreation/safety/boating/.

FWP also co-sponsors on-the-water paddling clinics to give newbies hands-on advice. "Most people don't understand that paddleboards are still vessels that have to comply with basic boating regulations, aquatic invasive species monitoring check station inspections, and life jacket requirements," Smith adds.

Sucking in water

This is Luepke and Fagone's 14th year of plucking people and boats from the Four Banger rapids. Their office today is a 17-foot aluminum jet boat powered by a 65-horsepower engine. With Luepke at the helm, the duo deftly maneuver the boat into position below the rapids and calmly and efficiently pluck one floater after another from the water. "If they don't have a life jacket, they're a priority," Luepke says. "Some of them panic when they hit the water," Fagone says, explaining that with the first shock of cold water, people often gasp—sucking in a lungful of the Yellowstone.

"Panic is what gets them," adds Josh Leonard, the Townsend warden, who has volunteered to help on this busy day. "If they'd just relax and go with the flow, they'd be far less likely to drown." He adds that remaining calm after being dumped from a boat, kayak, or inflatable toy is much easier if you're wearing a PFD that keeps your head above water.

By midmorning, boats begin pulling to the riverbank along Four Banger to watch and cheer on the braver souls paddling through the roaring waves. By noon, more than 60 boats line the bank. Revelers wearing superhero costumes, sombreros, and Viking and gladiator helmets shout, drink, and ooh and aah as floaters crash through the waves.

A newcomer to the spectacle might be surprised how many unseaworthy boats attempt the rapids. A fellow who goes by "Capt. Tim" says that one year someone tied 200 empty Clorox bleach bottles together with polystyrene rope, threw the contraption into the river, and jumped aboard. "Another year, a family had a round 20-foot-diameter water tank, like you put out for cattle, with lawn chairs set up around the edge with a cooler in the middle," he says.

A large inflatable pool float—with a 6-foot-tall peacock head and a round 12-foot-diameter base—is wisely beached nearby. In similar watercraft, bikini-clad women and shirtless, sunburned men float past and yell their appreciation to Fagone and Luepke. "Thank you for serving!" one rafter with a two-day beard slurs as he raises his beer in salute.

"I've never seen so many people who like wardens so much," Leonard says.

Here, where boaters and bystanders can see exactly how these FWP law enforcement officers save lives, the game wardens' value becomes crystal clear.

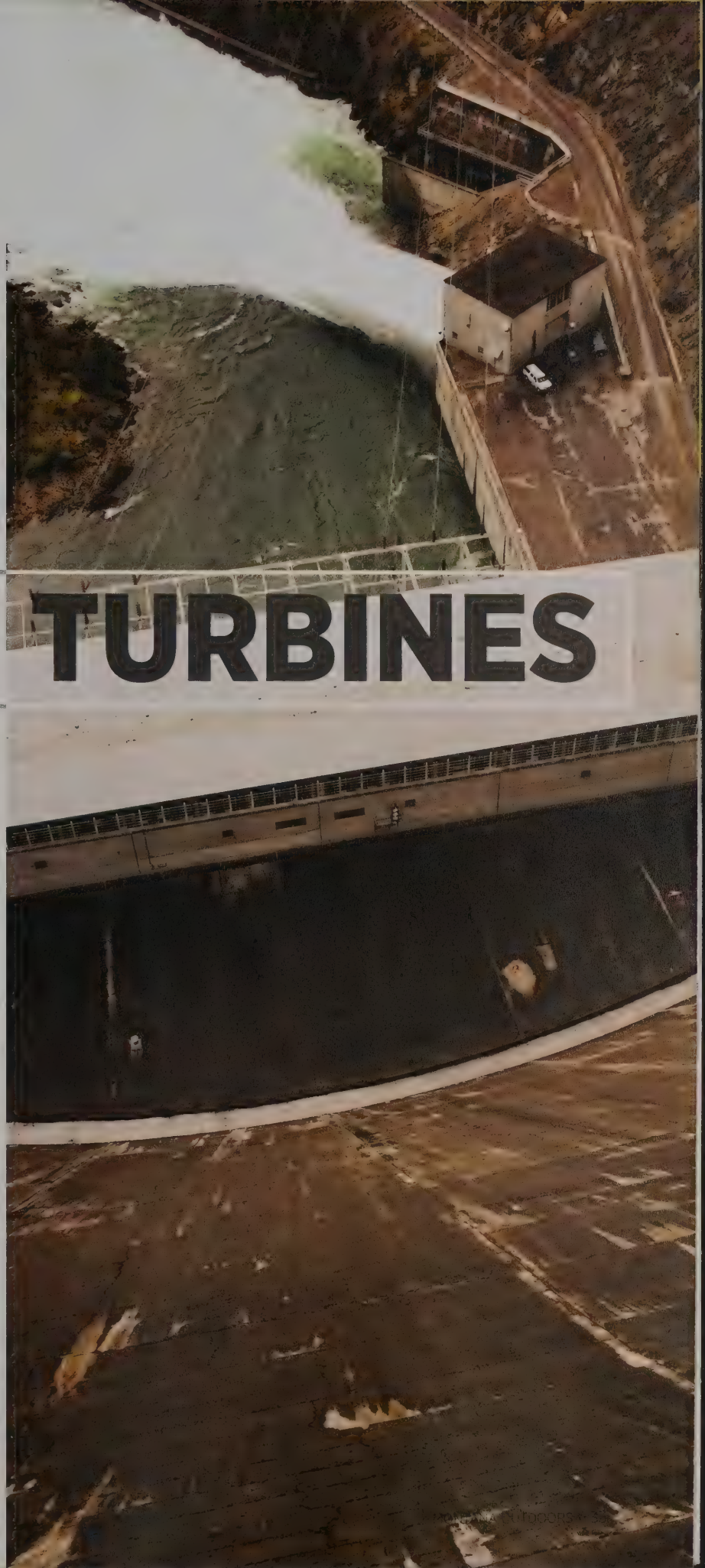
BETTER FOR BULLS Bull trout hold in the pool of a tributary of the South Fork Flathead River, in the Bob Marshall Wilderness Area upstream from Hungry Horse Dam. Water release and retention improvements at Libby Dam and Hungry Horse Dam (right) have decreased disruptions to the federally threatened species and helped other native salmonid fish populations up- and downstream from the two federal hydropower facilities.

THE FISH

FWP biologists have found a way to balance the needs of northwestern Montana's native species with hydropower generation, flood control, and even downstream salmon and steelhead populations.

BY BRIAN MAROTZ

AND THE TURBINES



I didn't realize it at the time, but the Northwest Power Act (NPA) of 1980 changed my life. If you live in the Pacific Northwest, including northwestern Montana, it likely changed yours, too. In fact, it just might be one of the best things you didn't know happened to you.

The NPA is a federal law intended to ensure low-cost electricity from federal dams in the Columbia River Basin. My relationship with the act began in 1985, when my wife and I packed a U-Haul truck with our worldly goods and two sedated house cats. With our little car on a tow dolly and a canoe on top, we left Louisiana State University in Baton Rouge and headed north to Libby, Montana. Montana Fish, Wildlife & Parks had hired me as an entry-level biologist on a 13-month contract to help keep water flowing in 10 spawning streams in Montana's slice of the Kootenai River Basin. My temporary job was part of a fish and wildlife program developed by the Northwest Power and Conservation Council (NPCC) and funded by the Bonneville Power Administration (BPA)—all part of the NPA. Yes, there have been a lot of acronyms in my life.

As I floored the truck's gas pedal and crept over the last climb into Libby, the Cabinet Mountains rose into view, and I thought I'd died and gone to heaven. During that first field season, I had to keep pinching myself. I was actually being paid to explore trout streams, measure water flows, and use electrofishing gear to estimate trout populations.

LEFT TO RIGHT: PAT CLAYTON/ENGBRETSON UNDERWATER PHOTOGRAPHY; JEREMIE HOLLMAN

BIOLOGICAL MODELS

About a year later, my supervisor, FWP fisheries biologist John Fraley, found out that I had written computer programs back in Louisiana for managing dams in that state's estuaries. He asked me to develop biological models for reservoirs above Hungry Horse and Libby Dams and use the models to develop rules for operating the dams in ways that balanced flood management and hydropower with the needs of fish and wildlife.

Soon after, I transferred to Kalispell to take a full-time FWP position funded by the BPA (see sidebar "BPA boosts fisheries and wildlife work in northwestern Montana" on page 35). My job was to supervise a talented fisheries crew to "mitigate impacts"—in other words, find ways to compensate for the harm to fisheries—caused by Hungry Horse and Libby Dams and continue working on biological models for the reservoirs.

Biological models are computer programs that track the effects of seasonal water levels on aquatic life, from tiny plankton to fish. In this case, our models showed how to ensure that the fisheries in Hungry Horse and Koocanusa (Libby Dam) Reservoirs were protected in all conditions, from drought to flooding.

Although I missed the wilds of Kootenai country and the mellow Libby lifestyle, my wife was delighted to move to the "big city" of Kalispell. I soon adapted to living near Glacier National Park and the Bob Marshall Wilderness—more examples of heaven.

Once we began to understand how to manage reservoirs, our team realized we also needed to learn how dams affect downstream fisheries. At this point I began leading fisheries teams that examined how habitats in the Kootenai and Flathead Rivers change as dam discharges fluctuate throughout the year. We also documented the ways that deep reservoir drawdowns affect fish populations.

By 1995, FWP could confidently recommend how the two hydropower dams could best operate to protect fish populations both upstream in the reservoirs and downstream in the rivers.

Brian Marotz recently retired from his position as FWP's hydropower mitigation coordinator.

BACK ON THE MAP The Columbia River Basin is one of the nation's largest watersheds, covering more than 260,000 square miles and providing drainage for hundreds of rivers, creeks, and streams. In 1980, Congress passed the Northwest Power Act to ensure low-cost electricity to Northwest ratepayers from federal dams in the basin. Under the legislation, the Northwest Power and Conservation Council manages fish and wildlife mitigation projects in the basin. For years, the council ignored the basin's two federal dams in Montana (circled in red) and the dams in British Columbia.

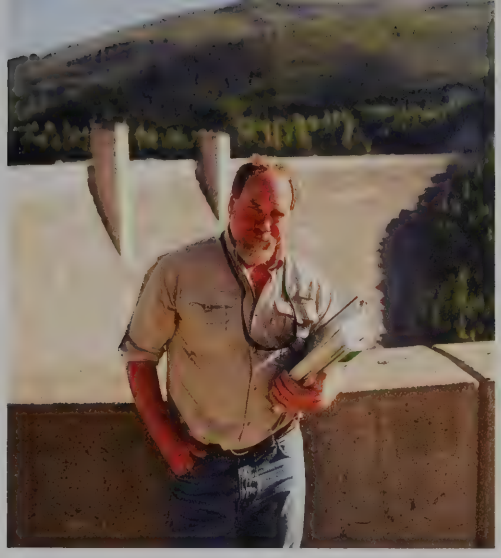
STATES CLASH

Montana's dams are just a small part of the mighty Columbia River hydropower system, which includes another 14 federal dams (and dozens of private dams) in Idaho, Washington, and Oregon. Fisheries in those states sometimes take precedence over those in Montana. For instance, federal regulations under the Endangered Species Act (ESA) required that Montana's dams release water to help recover salmon in the lower Columbia. Operations at our dams had to mesh with those of the other dams throughout the basin.

Not surprisingly, states began to fight over the needs of resident fish and wildlife in the headwaters versus those of salmon and steelhead, protected under the ESA, downstream in the Columbia River. Montana was at a distinct disadvantage at first, because we weren't even on the salmon-recovery maps at the time, which ended abruptly at the Idaho border. That's because Montana hasn't had sea-run fish like salmon and steelhead since at least the Wisconsin Ice Age some 12,000 years ago.

But the landlocked descendants of several sea-run species do live here. When the glaciers receded, Kootenai white sturgeon were isolated in Kootenay Lake, British Columbia. A white sturgeon population, listed as endangered under the ESA in 1994, still lives upstream into Montana as far as Kootenai Falls, between the cities of Libby and Troy. Steelhead that became trapped in the Kootenai headwaters shrank over millennia and are now called redband trout, the only native rainbow in Montana. They still share the river with burbot, a landlocked freshwater cod whose habitat also was split by Libby Dam. Landlocked sockeye salmon, known as kokanee, are also native to the Kootenai River drainage where it flows west into Idaho.

What's more, in recent decades the Kootenai, Clark Fork, and Flathead Basins of western Montana have become westslope cutthroat and bull trout strongholds. Bull trout were ESA-listed as threatened in 1999.



The westslope cutthroat, which remains in less than 10 percent of its historic range, has been petitioned for federal listing. It turns out that the largest intact stronghold of this species in the entire Rocky Mountain West is isolated upstream from Hungry Horse Dam.

Salmon and steelhead are important, but Montana has plenty of its own important and vulnerable native fish species to fight for.

To make that point during a presentation years ago to northwestern fish managers in Portland, Oregon, I added several large spigots representing the major rivers in Montana and British Columbia to the map they had been using, which was also blank north of the U.S.-Canada border. I joked to the audience that I was from that "other 'little-known country' known as Montana." They got the message. As you can see on the facing page, the map we're all now using shows the entire Columbia Basin.

BIPARTISAN SUPPORT

It took more than maps to protect Montana's fisheries interests. Our state successfully waged several battles in federal courts, supported by both Democratic and Republican officials, to keep our reservoirs and rivers from being sacrificed for downstream interests.

But Montana is a reasonable neighbor. So my team and I designed a water storage and release operating plan for Libby and Hungry Horse Dams that considered fish and wildlife, as well as flooding, throughout the entire Columbia River basin. By making some minor tweaks to the rules governing water operations at the Montana dams, we made sure that water released to benefit our resident fish species continues downstream to help recover anadromous fish in the lower Columbia, but not so much as to cause floods.

It's a delicate balancing act of social, economic, and ecological values. So far, it appears to be working.

When the dust settled, the courts, independent scientists, and the NPCC supported our operating plan for Montana's two Columbia Basin dams. What became known as the Montana Operation was adopted by the federal government and began guiding dam operations at Libby and Hungry Horse in 2009. Other FWP officials and I have heard from other states and British Columbia that Montana's operating strategy might eventually be applied to some of their hydropower dams.

And that's how the Northwest Power Act influenced my life and the lives of my colleagues and everyone else living in northwestern Montana. FWP fisheries professionals have used provisions in the federal legislation to protect and enhance Montana's fisheries resources. And the state of Montana, working with the federal government through various associations and councils, has found a way to ensure power generation, protect communities from flooding, keep rates low, and efficiently use mitigation funding to protect and restore the state's fish and wildlife habitat.

It's a delicate balancing act of social, economic, and ecological values. So far, it appears to be working.

FWP continues to fight for Montana's native fish as the United States renegotiates the Columbia River Treaty with Canada. Montana recommended using the Montana Operation for dam operations examined by the Columbia River System Operation Environmental Impact Statement (EIS) process completed earlier this year. "The Montana Operation was sustained and improved in the EIS's Preferred Alternative, which increases the odds that the next Columbia River Treaty will continue to keep northwestern Montana's reservoirs, rivers, and fisheries in good shape," Marotz says.

LEFT TO RIGHT: U.S. ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT VISUAL INFORMATION; JEREMIE HOLLMAN

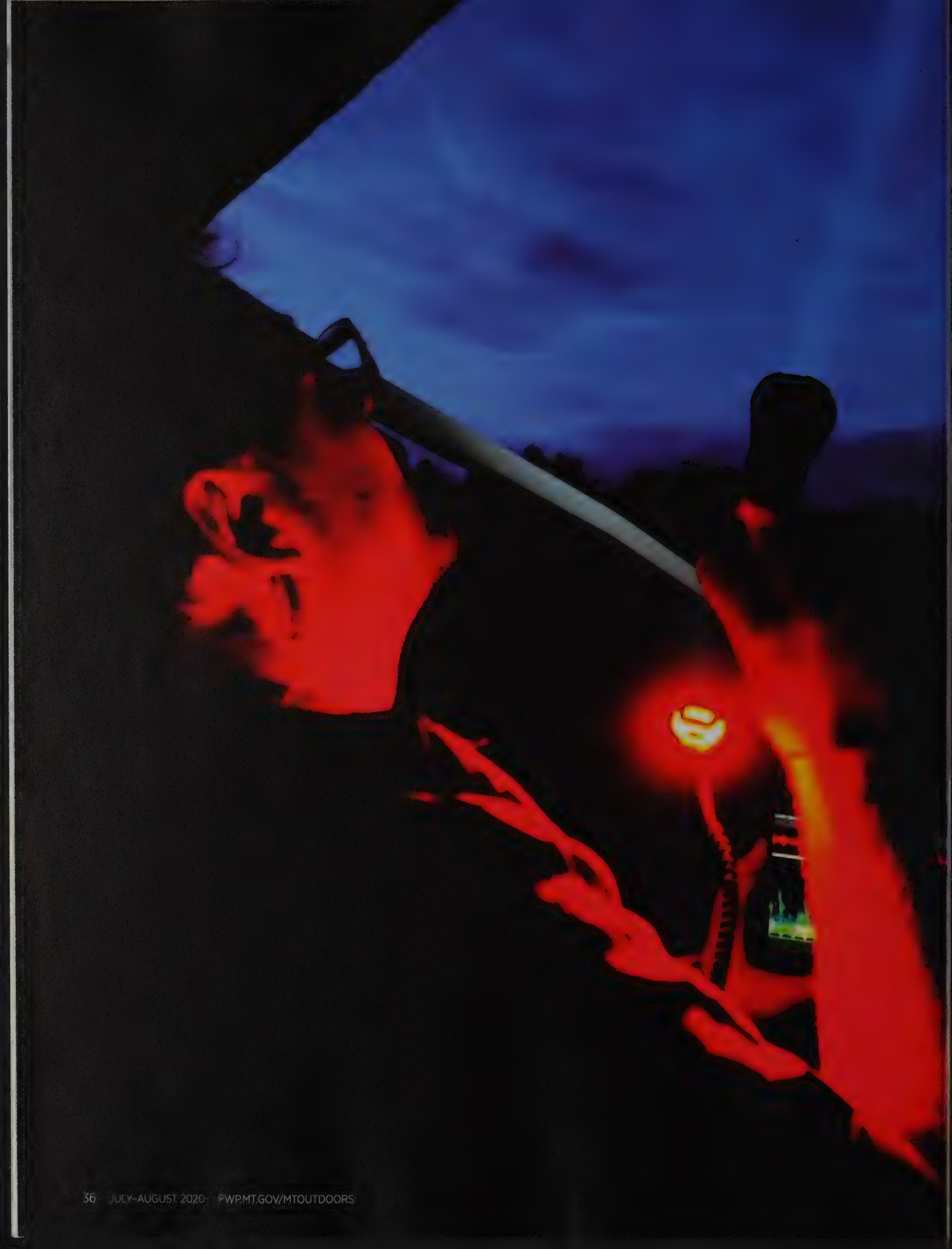
BPA boosts fisheries and wildlife work in northwestern Montana

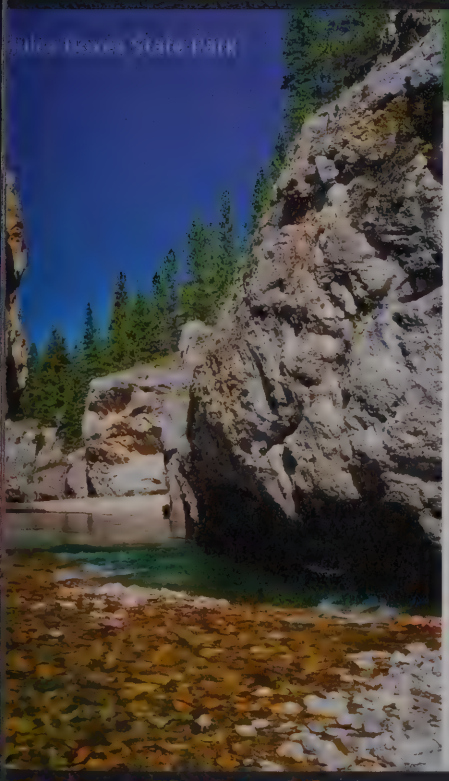
A significant number of the FWP fisheries positions in Montana's northwestern region are funded by the Bonneville Power Administration (BPA). This federal agency based in Portland, Oregon, was created by Congress to manage the sale of electricity from 31 hydropower dams on the Columbia River system. It's also responsible for building and maintaining electrical transmission lines throughout the region and—this is where FWP comes in—protecting fish and wildlife affected by hydropower operations.

Payment for the 25 FWP fisheries and 3 FWP wildlife positions comes from utility customers and from legal settlements requiring utilities to "mitigate"—compensate for—harm done to fish and wildlife populations and habitat from the construction and operation of hydropower dams. Avista Utilities and NorthWestern Energy also fund a few FWP fisheries positions in northwestern Montana.

"Our utilities-funded biologists, technicians, and hatchery crew are essential for the fish and wildlife work we do in this region," says Jim Williams, FWP regional supervisor in Kalispell. "This creates an incredible public-private-tribal partnership among our agency, the power utilities, Idaho Fish and Game, the Confederated Salish and Kootenai Tribes, and the Kootenai Tribe of Idaho, who are also recipients of BPA mitigation funding."

In addition to funding the positions, BPA, Avista, and NorthWestern Energy have helped pay for large portions of landscape-scale habitat projects that conserve nearly one-quarter million acres of fish and wildlife habitat and guaranteed future public access in projects like the Thompson-Fisher Conservation Easement and Osprey View Fisheries Conservation Areas in the North Fork, Swan, and Flathead Valleys, Williams says.





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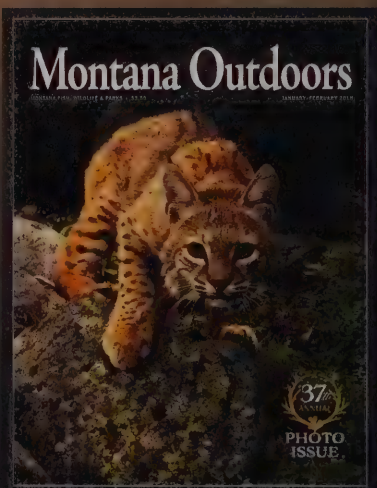

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On a Bat Safari

Tours at state parks and other sites across Montana introduce participants to a nighttime wildlife spectacle. **By Tom Kuglin. Photos by Thom Bridge.**

The low-flying ones come first, skimming over the water in the waning summer light.

Then, as darkness builds, the bat barrage begins. Thousands upon thousands of the winged mammals pour from crevices in the skyscraper-high limestone cliffs of the upper Missouri River's Gates of the Mountains area. It's their nightly commute to the mayflies, caddis flies, and other insects hovering nearby on upper Holter Reservoir. Spectators aboard a tour boat crowd around electronic devices that detect the bat's "biological sonar," making it possible to hear frequencies far beyond what the human ear can detect. Spotlights capture glimpses of the winged mammals darting wildly through the beams in spastic flight. It's a dizzying spectacle.

"I've done bat research all over the state, and you just don't get to see something like this," says Bryce Maxell, program coordinator for the Montana Natural Heritage Program, who leads the evening's tour along with fellow bat enthusiast Matt Bell.

Bats evolved to hunt in darkness, so they can't rely on sight to navigate the night sky and find their insect prey. Instead, they use echolocation by emitting sound waves from their mouth or nose. When the waves hit objects, the echoes bounce back to the bats' ears and indicate the object's distance, location, shape, and size—from a canyon wall to a mosquito.

Montana's 15 bat species each echolocates at a different frequency pattern. The bat-detecting devices and an app interpret the unique patterns to indicate which bat species are darting past. Of the 11 species confirmed in the Gates of the Mountains area, the most common are the big brown bat, little brown bat, and western small-footed myotis. Passengers surround Maxell and Bell as the guides' frequency-detecting devices interpret the echolocation waves and send data to an app on Bell's tablet that flashes the identity of each species on the screen.

NIGHT VISION Left: While helping with a tour on the Missouri River near Helena, bat expert Matt Bell shines a flashlight into the sky to locate a bat he picked up on his detector. Right: Tim Crawford, recently retired longtime manager of Gates of the Mountains, captains the *Canyon Voyager* on a 2019 tour on upper Holter Reservoir.

BAT MAN Bryce Maxell, program coordinator for the Montana Natural Heritage Program, talks about the biology of Montana bats during a Gates of the Mountains tour along the Missouri River near Helena. Tours in the canyon and at several state parks have become increasingly popular as more people seek to learn about Montana's nighttime wildlife. Top right: A tablet bat detector app. Lower right: A digital frequency-pattern detector.

The nearer a bat gets to a mosquito, the closer the clicks come. As one of the tiny fliers locks in on its prey, the clicks blend into a dull scream. Then silence: a successful hunt. "Bats are super loud. It's a good thing we can't hear the frequency range," says Maxell. "Tonight, it'd be like being out on the tarmac at an airport with a jet engine taking off."

In adddition to the tours run by Gates of the Mountains, a marina and boat tour company 15 miles north of Helena, Lewis & Clark Caverns, Lone Pine, and Spring Meadow Lake State Parks also offer bat watching outings each summer.

"People have been signing up like crazy. There's always a waiting list," says Ryan Schmaltz, a Montana Fish, Wildlife & Parks educator who coordinates nighttime bat tours at Spring Meadow Lake in Helena.

Tom Kuglin is the natural resources reporter and assistant editor at the Independent Record *in Helena. Thom Bridge is a photojournalist at the* Independent Record.

A large part of the tours' appeal, Schmaltz says, is to "see" wildlife that ordinarily remains hidden. "Bats are the most abundant animals flying around at night, but without detection gear, you wouldn't know that," he says.

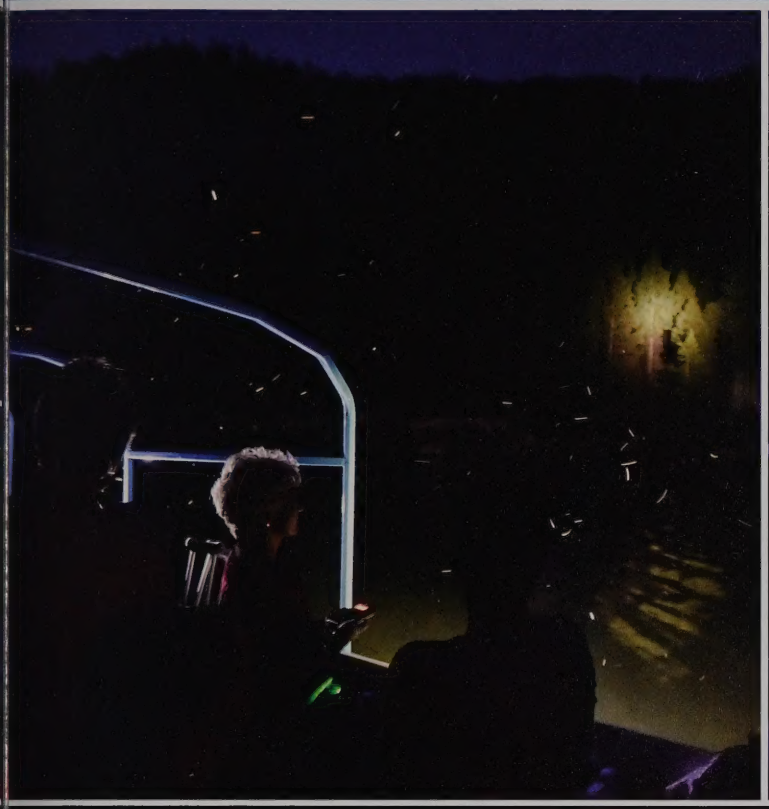
Boat tour passengers say they come to witness a nocturnal spectacle of nature and learn from experts about bats' mysterious lives. "Last year we did this for the first time, and we came out here again because it was such an amazing night," says Doug Holly of Helena, here with his wife, Jane. "It's kind of like bird watching, but you're doing it in complete darkness. You have no idea there are this many bats out there buzzing by your head."

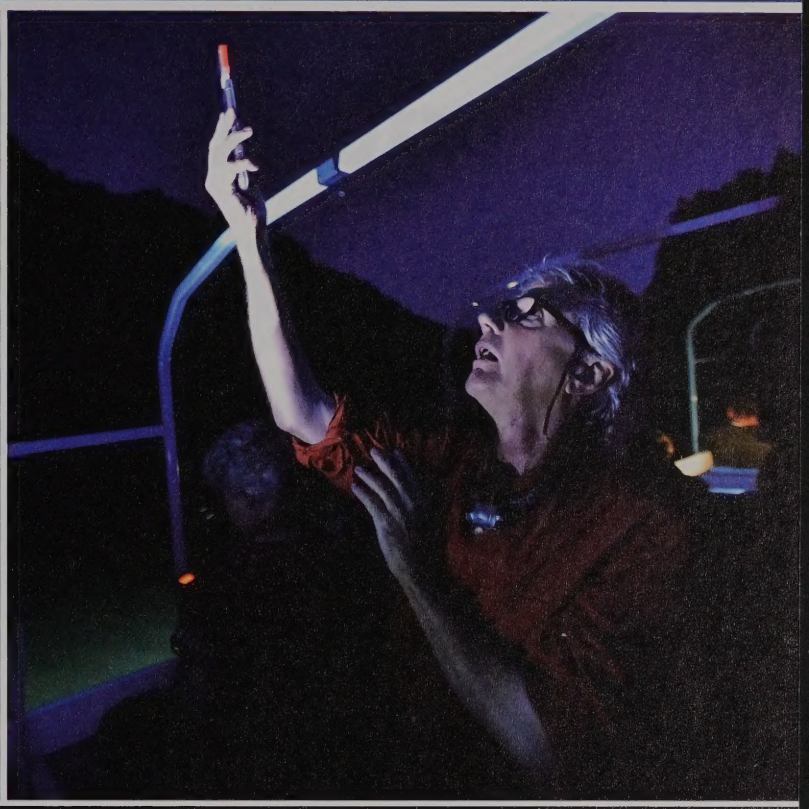
The bat concentrations at the Gates of the Mountains even impress Stewart Corn and Ellen Ferrari from Minnesota, members of Bat Conservation International and frequent travelers to bat hot spots across the United States. The pair regularly visit the nation's bat touring mecca: Bracken Cave near San Antonio, Texas, where watchers gather to see an estimated 20 million bats exit each night. "It's one of the largest concentrations of mammals anywhere on Earth. Just think of a waterfall going across your head. It goes on for hours and hours," Ferrari says. "Right now we're on vacation in Montana, and we love bats, so when we heard about this tour, we wanted to come."

Bat tours also offer experts the chance to generate excitement about the roughly 1,200 bat species worldwide, raise awareness of bats' valuable ecological role, and dispel common myths. "When I talk to people about bats, I always ask them if they like mosquitoes," says Lauri Hanauska-Brown, FWP Nongame Wildlife Bureau chief. "Bats eat a huge number of mosquitoes and other insects, so they make a significant difference as a natural pesticide."

Hanauska-Brown says that in Montana alone, the value of bats as pest insect consumers is hundreds of millions of dollars per year. In some parts of the world, bats are also key pollinators and seed dispersers.

One common misconception is that bats





SPOTTING THE UNSEEN Above left: Bat tour participants using spotlights watch bats migrate out of the Gates of Mountains canyon. Above right: Doug Holly of Helena uses a microphone and bat detector smartphone app to identify the bats species flying overhead. Experts say that the most common species in the canyon are the big brown bat, little brown bat, and western small-footed myotis.

in houses need to be exterminated. "Because a lot of people are terrified of bats, they want them eliminated from their attic," Hanauska-Brown says. "But bats can coexist well with people, causing no problems. Many people have bats in their attics or behind their house siding and never know it."

Other misconceptions include the belief that bats are a type of rodent (they are in fact more closely related to lemurs and monkeys) and are especially prone to carrying diseases such as rabies. "All mammals can get rabies," Hanauska-Brown says. "But usually the only time people see a bat close up is when it's sick or dead. And in that case, yes, that bat may have rabies. But the percentage of the population with rabies is actually small—less than half of one percent."

Tour participants also learn about the threats facing bats. FWP officials estimate that thousands of bats die each year by slamming into the rotors of wind energy turbines. The department works with energy companies to site turbines in areas where collisions are less likely or to alter operations in ways that reduce collisions.

The biggest threat has yet to be documented in Montana. White-nose syndrome (WNS) is a deadly disease that has killed millions of hibernating bats in 35 states and seven Canadian provinces since being discovered in New York in 2006. The fungal infection appears as a white fuzz on bats' faces and attacks their bare skin, sometimes eating holes in their wings while they hibernate. Infected bats become more active than normal during hibernation and burn up energy reserves needed to survive the winter, eventually causing starvation.

FWP, the Montana Natural Heritage Program, the U.S. Forest Service, and the Bureau of Land Management have surveyed bat wintering sites, known as hibernacula, over the past eight years looking for traces of WNS in bats. "It has recently been detected in the Dakotas and Wyoming, and we assume that it's just a matter of time before we detect it here," Maxell says. The agencies also work closely with the Northern Rocky Mountain Grotto and Bigfork High School Caving Club. The organizations of dedicated cave explorers help public agencies find and access remote caves, and spread the message to members and other "cavers" about the importance of decontaminating clothing and gear to prevent spreading the fungus.

Experts are hopeful WNS won't be as severe in Montana because bats here tend to den in smaller groups than in other states.

Tonight, as the bat recorders click away, registering hundreds of bats swooping overhead, it's difficult to imagine that these winged mammals could ever disappear. "I've been caving for 57 years, and we generally don't see many bats in caves. We're always fascinated when we do see some," says Mary Alice Chester of Helena. "On a night like this, with so many bats, it's quite a thrill."

To sign up for a Gates of the Mountains bat tour, visit gatesofthemountains.com. For information on tours at Lewis & Clark Caverns, Lone Pine, and Spring Meadow Lake State Parks, call or email park offices.

I've got this

Outdoor magazines regularly provide backcountry survival advice. Tips like how to avoid dehydration, freezing, hypothermia, lightning strikes, drowning, and bear attacks.

But I've yet to read about what may be the biggest threat of all: overconfidence.

Overconfidence has put me in peril more than once. Like the Sunday afternoon I set out to hunt elk in the Little Belt Mountains. I'd planned to follow a simple route I'd found the previous weekend: up a drainage then back to the vehicle by sundown. I didn't bother bringing a compass, much less a GPS. It was a straightforward out-and-back hunt.

Except it wasn't. The trail imperceptibly circled around a small mountain. While I thought I was heading east, I was actually going northeast, then north, then northwest. When it came time to turn back, the location of the setting sun completely threw me. Instead of backtracking, I panicked and scrambled uphill to see if I could spot the logging road I'd driven in on. By the time I reached a place where I could see anything, it was dark. I was completely lost.

As I sat in the snow pondering my ability to survive the cold November night, I saw headlights below in the distance. A pickup seemed to be driving down the mountainside, miles from the road. Then I realized that *was* the road. My bearings readjusted, I made my way down the mountain, found my vehicle, and arrived home just as my wife was considering a call to search-and-rescue.

Recreating outdoors requires some amount of confidence—that you won't fall off a cliff, for instance, or step on a rattlesnake. Otherwise you wouldn't set foot out the front door. But overconfidence? That can be as dangerous as a startled grizzly with cubs.

Cockiness in the natural world usually comes from a delusional sense of our own abilities. We guys are especially prone. Here in the West, we're supposedly born able to ride a horse, shoot a gun, win a fistfight, and run a rapids. Real men face uncertainty with, "I've got this."

That was my thinking one Saturday in June when my wife and I set off for our first float down the Dearborn, said to be one of Montana's prettiest rivers. The previous week the flow had been about 400 cubic feet per second (cfs), ideal for canoeing. But it rained hard on Friday night. By the time we reached the put-in, the river was the color of chocolate milk and cranking at over 900 cfs.

Piece of cake, I said to myself. I'd been canoeing most of my life. I'd paddled the Boundary Waters Canoe Area Wilderness many times, often traversing the wind-tossed, sealike lakes bordering Canada.

But a lake is not a fast-moving river.

On the Dearborn, I managed to negotiate the first several 90-degree bends and standing-wave rapids, although we took on water and had to pull over to bail. "Are we okay?" Lisa asked after the third stop. By then we were about five miles in and had no way out of the steeply walled canyon except to carry on downstream. "Sure," I said, confidently, though by then I knew we were not okay.

About 30 minutes later, while rounding a bend, we could hear the dull roar of a major rapids. With no time to stop and scout a safe route, we plunged straight into the first standing wave. It hit Lisa square in the chest, knocking her overboard and flipping the canoe. I tumbled through the rapids, bouncing from boulder to boulder in the icy water. I hit one rock so hard I thought my leg was broken.

I crawled to shore and yelled for Lisa. She isn't a strong swimmer, so I imagined the worst. Thankfully, after several excruciating minutes, I heard her reply from downstream. She was shaken and cold but otherwise okay.

The canoe had been swept away, so we climbed out of the canyon and began a five-mile hike back to the car. As I hobbled along after Lisa, using my paddle as a crutch, I wanted to kick myself. My cocksure attitude had put not only my own life in danger, but hers, too.

Then I noticed we both had our life jackets on, and had been wearing them the entire trip. Thankfully, we'd not just stowed them in the canoe—as required by law—but actually put them on. That may have saved our lives.

Some men view wearing a life jacket as an unmanly indication they can't swim or handle a boat. That they in fact haven't "got this."

I'll admit I was foolishly overconfident on the Dearborn, and I definitely learned the limits of my whitewater canoeing skills. But at least I wore my life vest. I'll take wearing a bit of extra bulk over drowning any day.

Tom Dickson is the editor of Montana Outdoors.

ILLUSTRATION BY STAN FELLOWS

Ring-billed gull

Larus delawarensis

By Jim Pashby

SCIENTIFIC NAME *Larus* is a Latin word for a gull or other large seabird. *Delawarensis* refers to the Delaware River, where the first specimen was recorded.

For most of us, the wheezing squeals and squawks of seagulls evoke memories of the seaside, the smell of saltwater, and the feel of warm sand underfoot.

So what were these noisy white birds doing fighting over french fries in the McDonald's parking lot in Havre, 1,000 miles from the nearest ocean?

When I set out to solve the riddle, the first thing I learned is that, technically, there is no single "seagull" bird species. There are two dozen gull species in North America. Though most spend at least part of the year along an ocean shoreline, some live their entire lives no closer to the sea than a pronghorn or jackrabbit does. I also learned that many gull species are nearly identical, with a white head, neck, and chest; gray wings with black wingtips; and yellow legs and bill.

Montana is home to 18 resident or migrant gull species. The most common are the Franklin's gull, the California gull, and the species I saw in Havre that day, the ring-billed gull.

IDENTIFICATION

The ring-billed gull is a crow-size bird with a white head and breast, gray back and wings, black wing tips, and the namesake black ring near the end of its bill.

The species can be distinguished from other white-headed gulls by its lack of the red "gony spot" found on the lower mandible (beak bottom) of the herring, western, and California gulls. In addition to the red gony spot, the California gull has a black mark on its bill that makes the bird, from a distance, look like a ring-billed gull.

HABITAT

Ring-billed gulls are common across Montana except in the far west and southeast. The birds are especially abundant in areas with large reservoirs and lakes, including Ninepipe, Bowdoin, and Medicine Lake National Wildlife Refuges, Fort Peck Reservoir, Freezeout Lake, and Flathead Lake. Because ring-billed gulls tolerate people, they also hang around golf courses, landfills, and the parking lots of fast-food restaurants, motels, and big box stores.

DIET

You name it, ring-billed gulls eat it: garbage, crayfish, worms, insects, fish, small mammals, and the eggs and chicks of other birds.

A 1990s study at Ninepipe National Wildlife Refuge north of Missoula found that the ring-billed gulls' primary prey were two vole species. Another study, published in 1960, investigated whether ring-billed gulls at Freezeout Lake were eating duck eggs or killing ducklings. They weren't. Stomach contents revealed that the gulls were instead consuming mostly earthworms, crayfish, insects, mice, and spent barley from local farm fields.

NESTING

Ring-billed gulls nest in colonies on the ground, usually on a sparsely vegetated peninsula or island of a lake or reservoir. Breeding pairs construct a nest consisting of a scraped shallow impression in the ground lined with twigs, dried reeds, sticks, grasses, or leaves. The female lays two to four eggs, which hatch in three to four weeks. Ring-billed gulls raise only one brood each year, but they re-nest if a predator or flooding destroys the eggs.

CONSERVATION STATUS

Like fox squirrels, Canada geese, crows, and coyotes, ring-billed gulls thrive in developed landscapes. They are especially fond of waste crops and garbage dumps. As long as people grow grains and create trash, this species is not going anywhere.

Jim Pashby is a writer in Helena.

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Whether it's through fishing, camping, boating, hunting, hiking, wildlife watching, or **mountain biking on the Big Dorothy Trail near Helena,** Montana is a state where everyone can find their own special way to connect with the natural world. Around here, **the outside is in us all.** PHOTO BY JASON O'NEIL

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